IMPORTANT BIRD AND BIODIVERSITY AREAS IN INDIA

Priority sites for Conservation

Revised and updated 2nd Edition Vol. II

BirdLife INTERNATIONAL

BNHS India CONSERVING NATURE SINCE 1883

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Second Edition: Revised and Updated

Volume II

Asad R. Rahmani, **M. Zafar-ul Islam** and **Raju M. Kasambe**

Maps prepared by

Mohit Kalra and **Noor I. Khan**

Team Members

Noor I. Khan, **Siddesh Surve, Abhijit Malekar** and **Nandkishor Dudhe**

Significant Contribution to this edition

Anwaruddin Choudhury, Arvind Mishra, Ajai Saxena, Dhananjai Mohan, Himmat Singh Pawar, Intesar Suhail, Khursheed Ahmad, Neeraj Srivastava, P.O. Nameer, Manoj Nair, Mrutyumjaya Rao, Praveen, J., Sanjeeva Pandey, S. Subramanya, Satya Prakash

Editors

Gayatri Ugra and **Maithreyi, M.R.**

Layout and Design

V. Gopi Naidu

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Bombay Natural History Society,
Hornbill House, Shaheed Bhagat Singh Road, Mumbai-400001, INDIA.
Telephone: 0091-22-28429477 and 0091-22-22821811. Fax: 0091-22-22837615.
Email: info@bnhs.org; websites: www.bnhs.org and www.ibcn.in

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Designed: V. Gopi Naidu.

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KERALA

P.O. NAMEER

Despite high human density, Kerala has six national parks and 17 wildlife sanctuaries, which cover 23.7% of the total forest area and 6.12 % of the geographical area of the state. Kerala also has a very robust and active conservation and social organizations who fight for the protection of forest and wildlife, best exemplified by the successful struggle to save the Silent Valley forest.

Kerala (8° 17' - 12° 47' North and 74° 52' - 77° 24' East) is one of the smaller states of India. With an area of 3,886,300 sq. km., Kerala constitutes about 1.18% of the land area of India. The State is divided into 14 administrative districts. The Union Territory of Lakshadweep is situated in the Arabian Sea off the coast of north Kerala. Tamil Nadu forms a border on the south and partly on the east, and Karnataka is located on the north and northeast. Its greatest length north to south is about 545 km and its greatest width is about 120 km, though most parts are considerably less wide (Ali 1999).

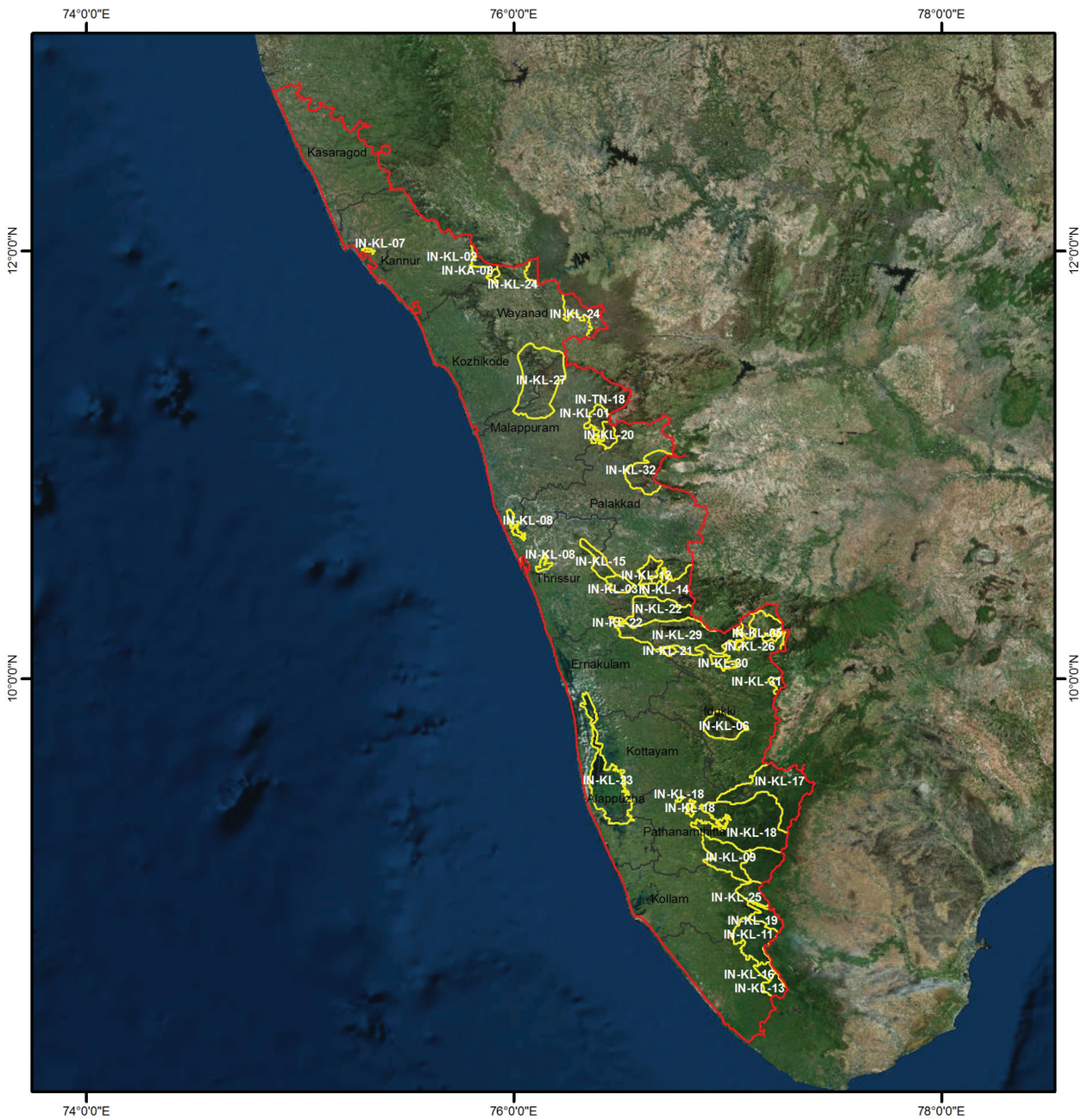
Kerala can be physiographically subdivided into Lowlands (< 75 m above msl), Midlands (75-500 m above msl), Highlands (500-780 m above msl) and High ranges (> 750 m above msl) (Iype *et al*. 1991). The Lowlands comprise the long and narrow coastal belt on the west with stretches of sand and backwaters. Extensive paddy fields and numerous coconut plantations dominate the landscape in this area.

In between the highland and lowland is the midland, which is undulating country covered by laterite soil cut across by rivers with isolated hills and plains leading to the forest-clad highlands. Paddy is the common crop in the valleys, while tapioca is cultivated on the slopes and highlands. The Western Ghats that bound Kerala on its eastern side, constitute dominant highland. While thick forests cover the upper ranges in this mountain area, the lower ranges have plantations, which are interspersed with forests. Crops such as tea, coffee, cardamom and turmeric abound in the higher elevations whereas in the sub-mountainous tracts and below the Ghats, crops like pepper, rubber and ginger are grown. The continuous mountain is broken only by the Palghat Gap, a transverse valley about 25 km wide which cuts across it, sharply dividing the Nilgiris from the Nelliampathi Hills of the Thrissur district, to their south (Ali 1999). The Wynaad tableland, 95 km by 50 km, at an average elevation of 900 m, is interesting for its avifauna and other fauna.

The rivers of Kerala have blessed the State with an abundance of water resources. Fortyfour rivers flow through Kerala. The bigger rivers are Bharatapuzha, Periyar, Pampa and Chaliyar which exceed 160 km in length, while all the others are relatively small with an average length of about 64 km (Menon 1997). The state has an extensive range of

IN-KL

Important Bird Areas in Kerala



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Kilometers

physical features that result in a corresponding diversity of climatic features. The high ranges of Kerala have a cool and bracing climate while the plains are hot and humid. The temperature ranges from 19.8 °C to 36.7 °C. Owing to the mountainous nature of the State, it receives heavy rainfall. However, there are some rain shadow areas that receive less than 1,000 mm rainfall. The most important of the rain shadow area is the Chinnar Wildlife Sanctuary (an IBA) where the rainfall is about 500 mm. However, in most of the other areas, the average annual rainfall varies between 1,520 to 4,075 mm, June being the month of the heaviest rainfall.

The State is the major producer of food crops like grains, cereals and pulses. The principal plantation crops are rubber, tea, coffee and cardamom. The total 33,387,677 million inhabitants as per the 2011 census, of which 47.2% is rural the population density is 859 persons per sq. km (2011 Census Data Online: Population.), and it is one of the densely populated states of India (Forests Survey of India, 2011). In 2007 the livestock population of the state was 3.59 million (Livestock Census 2007)

Almost all forest types of the Western Ghats are seen in Kerala, from Tropical Evergreen, Tropical Semi-evergreen, Tropical Moist Deciduous, Montane Sholas, to Dry Deciduous, Grasslands and Lowland Scrub jungles.

The forests of Kerala are home to some of the endemic and threatened species of India. For example, Agasthyamalai is the abode of 150 endemic taxa of flowering plants. As far as balsams are concerned, the hills of Munnar are said to be the richest in the world, with more than 30 species of balsams within 16 sq. km (Pillay 1929, John 1936, Barnes 1939). Hora and Nair (1941) and Hora and Law (1941) have documented the fish fauna of the State. About 150 species of freshwater fish have been reported from the Western Ghats of Kerala as well from other parts of the State. According to Menon (1987) there are about 40 species of Indian freshwater fish, which are either seriously threatened or rare, and deserve immediate protection. A blind catfish, discovered in Kottayam (Menon 1950) is known only from Kerala. Ten endemic fish species have been reported from the State including *Puntius denisonii, Osteobrama bakeri Day, Garra surendranathanii, Osteochilus longidorsalis, Chela fasciata, Travancoria jonesi, Nemacheilus keralensis, Horabagrus brachysoma, Batario travancoria, Tetraodon travancoricus*; about 28 species of Endangered fish, and seven species of Critically Endangered fish *Pisoclonoplius boro, Tor tor, Travancoria jonesi, Horalabiosa joshuai, Nemacheilus noomilis, Balitora mysorensis, Chela fasciata* have been reported (Biju *et al.* 2000).

Accoding to Kerala Forest Department 159 species of reptiles occur in Kerala, which include two species of crocodiles (one belived to be extinct), 12 species of turtles, 48 species of lizards and 97 species of snakes. In Nilgiri Biosphere Reserve part of Kerala, a total of 62 species of reptiles were recorded. These include one species of crocodile, four species of turtles, eight species of geckos, nine species of agamids, one species chamaeleon, seven species of scincids, one species of monitor lizard and thirty one species of snakes. Eighteen of them (*Indotestudo forsteni, Cnemaspis beddomei, Cnemaspis wynadensis, Calotes ellioti, C. grandisquamis, C. rouxi, Dracodussumieri, Salea horsfieldii, Scincella laterimaculatum, S. travancoricum, Ristella beddomii, Rhinophis sanguineus, Teretrurus sanguineus, Ahaetulla perroteti, Amphiesma beddomei, A. monticola and Calliophis bibroni*) are endemic to Western Ghats.

Kerala is extremely rich in frog species. Till now 83 species have been described from the state (Sivaprasad 2013). New species are being described on regular basis. For example, Biju et *al.* (2011) conducted a survey in June 2010, from which he described two new species of Night Frog from Kaikatti, Nelliyampathy. One was named as *Nyctibatrachus acanthodermis* due to presence of prominent spinular dorsal skin. This species is known only from its type locality. The other

P.O. NAMEER

In the 1970s and 1980s, large numbers of hydro-power dams were constructed, submerging valleys with tropical evergreen and semi-evergreen forests. These dams and resultant reservoirs have fragmented forests for many species

P.O. NAMEER

is *Nyctibatrachus deveni*. In October 2011 in another survey Biju et *al*. (2014) discovered a new species of Frog named as Nelliyampathi Dancing Frog *Micrixalus nelliyampathi*. This frog is restricted between Palghat Gap and Shencottah gap. Another species was described from Periyar Tiger Reserve and named *Nyctibatrachus periyar (*Biju et *al*. 2011).

Vegetation

The major forest types observed in Kerala are Tropical Evergreen, Tropical Semi-evergreen, Tropical Moist Deciduous, Dry Deciduous, Montane *Sholas*, Savannas, Grasslands and Lowland Scrub jungles. The outstanding feature of the Western Ghats of Kerala is the development of Tropical Rain Forest towards the south between 500-1500 m (Subramanyam and Nayar 1974, Chandrasekaran 1962). The flora and fauna of the Western Ghats in general have been discussed by several authors (*see* Islam and Rahmani 2004 for reference therein).

Ali (1969) has broadly divided the forest of Kerala into four classes, as follows:

(i) Heavy Moist Evergreen, confined to the Ghats (chiefly the western slopes) and ravines, and perhaps to one-third of the upper hill plateau.

(ii) Land originally covered with Evergreen Forest, but now overgrown by secondary scrub jungles of various ages.

(iii) Deciduous Forest with tall coarse grass growing under the trees which cover the ridges and higher ground and a part of the hill plateau.

(iv) Rock and stony land covered with short grass (*shola* grasslands).

Recently, Nair (2011) has described in detailed the changing landscape of Kerala, and consequences to wildlife and human beings. It is beyond the scope of this book to describe these changes in detail.

IBAs AND PROTECTED AREAS

Kerala has a long history of protecting wild animals. There are six national parks and 17 wildlife sanctuaries

Protected Areas of Kerala (as on December 2014)

	National Parks	Year of establishment	Size in sq. km.	District(s)
1.	Anamudi Shola NP	2003	7.50	Idukki
2.	Eravikulam NP	1978	97.00	Idukki
3.	Mathikettan Shola NP	2003	12.82	Idukki
4.	Pampadum Shola NP	2003	1.32	Idukki
5.	Parambikulam TR	1973	285.00	Palakkad
6.	Periyar TR	1982	350.00	Idukki & Pathanamthitta
7.	Silent Valley NP	1984	236	Palakkad
	Wildlife Sanctuaries			
1	Aralam WLS	1984	55.00	Kannur
2	Chimmony WLS	1984	85.00	Thrissur
3	Chinnar WLS	1984	90.44	Idukki
4	Chulannur Peafowl WLS	2007	3.42	Thrissur & Palakkad
5	Idukki WLS	1976	70.00	Idukki
6	Kottiyoor WLS	2011	30.38	Kannur
7	Kurinjimala WLS	2006	32.00	Idukki
8	Malabar WLS	2010	74.22	Kozhikode
9	Mangalavanam Bird WLS	2004	0.03	Ernakulam
10	Neyyar WLS	1958	128.00	Thiruvananthapuram
11	Peechi-Vazhani WLS	1958	125.00	Thrissur
12	Peppara WLS	1983	53.00	Thiruvananthapuram
13	Periyar WLS	1950	427.00	Idukki
14	Shendurney WLS	1984	100.32	Kollam
15	Thattekad Bird WLS	1983	25.00	Ernakulam
16	Wayanad WLS	1973	344.44	Wayanad
	Community Reserve			
1	Kadalundi	2007	1.50	Malappuram

ERACH BHARUCHA

Some of the old reservoirs such as in Periyar Tiger Reserve are quite picturesque and attract hordes of tourists. Asiatic Elephant and Guar have become used to people and can be easily watched grazing on the luxuriant grass on the margins of reservoirs. Periyar, an IBA, is also a major birding destination

ERACH BHARUCHA

IBAs of Kerala		
IBA site codes	**IBA site names**	**IBA criteria**
IN-KL-01	New Amarambalam Reserve Forest	A1, A2, A3
IN-KL-02	Aralam Wildlife Sanctuary	A1, A2, A3
IN-KL-03	Chimmony Wildlife Sanctuary	A2, A3
IN-KL-04	Chinnar Wildlife Sanctuary	A1, A2, A3
IN-KL-05	Eravikulam National Park	A1, A2, A3
IN-KL-06	Idukki Wildlife Sanctuary	A1, A2, A3
IN-KL-07	Kattampally	A1, A4i, A4iii
IN-KL-08	Kole Wetlands	A1, A4i, A4iii
IN-KL-09	Konni Reserve Forest	A1, A2
IN-KL-10	Kottiyoor Reserve Forest	A1, A2, A3
IN-KL-11	Kulathupuzha Reserve Forest	A1, A2, A3
IN-KL-12	Nelliyampathy Hills	A1, A2, A3
IN-KL-13	Neyyar Wildlife Sanctuary	A1, A2, A3
IN-KL-14	Parambikulam Tiger Reserve	A1, A2, A3
IN-KL-15	Peechi-Vazhani	A1, A2, A3
IN-KL-16	Peppara Wildlife Sanctuary	A1, A2, A3
IN-KL-17	Periyar Tiger Reserve	A1, A2, A3
IN-KL-18	Ranni Reserve Forest	A1, A2, A3
IN-KL-19	Shendurney Wildlife Sanctuary	A1, A2, A3
IN-KL-20	Silent Valley National Park	A1, A2, A3
IN-KL-21	Thattekkad Wildlife Sanctuary	A1, A2, A3
IN-KL-22	Vazhachal Forest Division	A2, A3
IN-KL-23	Vembanad Lake	A3, A4i, A4iii
IN-KL-24	Wayanad Wildlife Sanctuary	A1, A2, A3
IN-KL-25	Achenkovil Forest Division	A1, A2, A3
IN-KL-26	Anamudi Shola NP	A1, A2, A3
IN-KL-27	Camel's Hump Mountain	A1, A2, A3
IN-KL-28	Kurinjimala Wildlife Sanctuary	A1, A2, A3
IN-KL-29	Malayattur Reserve Forest	A2, A3
IN-KL-30	Mankulam Forest Division	A1, A2, A3
IN-KL-31	Mathikettan Shola NP	A1, A2, A3
IN-KL-32	Muthikulam-Siruvani	A1, A2, A3
IN-KL-33	Pampadum Shola NP	A1, A2, A3

in the state covering protected area totals 17,300 sq km. which cover 23.7% of the total forest area and 6.12 % of the geographical area of Kerala State. There is 24 sq. km loss of forest cover as compared to the previous assessments (Forests Survey of India, 2011). The State has some of the most well-known sanctuaries of India such as Periyar Tiger Reserve, Eravikulam National Park, Parambikulam Wildlife Sanctuary and Silent Valley National Park (all selected as IBAs). There is a small Community Reserve known as Kadalundi. There is no Conservation Reserve in Kerala yet.

IMPORTANT BIRD AND BIODIVERSITY AREAS OF KERALA

In 2004, 24 Important Bird Areas were identified in Kerala (Islam and Rahmani 2004). Since then, based on field work, consultation with experts and literature review, nine more IBAs have been added, making a total of 33. In order to keep the original IBA side code intact, we are listing them at the end in alphabetic order.

AVIFAUNA

Kerala has a long history of ornithological surveys. Based on the birds collected by Fulton and Frank Bourdillon, A. O. Hume wrote two papers in *Stray Feathers* (Hume 1876, 1878). At almost the same time, H. S. Ferguson, another tea planter, collected birds and wrote a series of papers in *JBNHS* (Ferguson and Bourdillon 1903, 1904). An exhaustive investigation of the forest birds of Travancore was conducted by Ali and Whistler (1935-1937). Later, Ali (1969) published his book *Birds of Kerala* which has been updated in 1999. Neelakantan *et al*. (1993) recorded 483 species of birds in the State, of which 149 species are found in the coastal areas and the remaining in the mid and highlands. In 2011, a comprehensive book detailing status and distribution of birds of Kerala was written by Sashikumar *et al*. (2011). The book contains data on 491 species of birds segregated in the 'Main List' of 453 species, and the 'Secondary List' of another 49 species, found within the political boundaries of the state. By end of 2013, Praveen

P.O. NAMEER

Small populations of White-rumped Vulture (above) and Long-billed Vulture still survive in Wayanad WLS and adjoining areas

List of threatened birds with IBA site codes	
CRITICALLY ENDANGERED	
White-rumped Vulture *Gyps bengalensis*	IN-KL-02, 17, 24
Long-billed (Indian) Vulture *Gyps indicus*	IN-KL-17, 24
Red-headed Vulture *Aegypius calvus*	IN-KL-02, 24
ENDANGERED	
Egyptian Vulture *Neophron percnopterus*	IN-KL-08
Nilgiri (Black-chinned) Laughingthrush *Strophocincla cachinnans*	IN-KL-01, 02, 20, 27, 33
Black-bellied Tern *Sterna acuticauda*	IN-KL-08
White-bellied Blue Robin *Myiomela albiventris*	IN-KL-05, 11, 12, 13, 16, 17, 19, 20, 25, 26, 29, 31, 32, 34
Nilgiri Blue Robin *Myiomela major*	IN-KL-02, 20, 27, 33
VULNERABLE	
Lesser Adjutant *Leptoptilos javanicus*	IN-KL-01, 14, 24
Asian Woollyneck *Ciconia episcopus*	IN-KL-01, 07, 08, 09, 14, 15, 17, 23, 24
Indian Spotted Eagle *Clanga hastata*	IN-KL-07, 08, 23
Greater Spotted Eagle *Clanga clanga*	IN-KL-06, 07, 08, 17, 23
Eastern Imperial Eagle *Aquila heliaca*	IN-KL-07
Macqueen's Bustard *Chlamydotis macqueeni*	IN-KL-08
Wood Snipe *Gallinago nemoricola*	IN-KL-17, 19, 24, 33
Nilgiri Woodpigeon *Columba elphinstonii*	IN-KL-01, 02, 05, 06, 09, 10(?) 11, 12, 13, 14, 16, 17, 18, 19, 20, 21, 24, 25, 26, 27, 28, 29, 31, 32, 33, 34
Yellow-throated Bulbul *Pycnonotus xantholaemus*	IN-KL-04, 21, 33
Kashmir Flycatcher *Ficedula subrubra*	IN-KL-05, 33
Bristled Grassbird *Chaetornis striata*	IN-KL-07
Indian Broad-tailed Grass-warbler *Schoenicola platyurus*	IN-KL-05, 06, 10, 12, 13, 15, 16, 17, 18, 19, 20, 21, 27, 33
Nilgiri Pipit *Anthus nilghiriensis*	IN-KL-04, 05, 10, 11, 12, 13, 14, 15, 17, 20, 26, 29, 31, 33, 34
NEAR THREATENED	
Spot-billed Pelican *Pelecanus philippensis*	IN-KL-08, 17, 23
Oriental Darter *Anhinga melanogaster*	IN-KL-02, 03, 06, 07, 08, 09, 13, 14, 15, 16, 17, 19, 21, 22, 23, 24, 25, 27, 28, 30, 33
Painted Stork *Mycteria leucocephala*	IN-KL-07, 08, 17, 23
Black-headed Ibis *Threskiornis melanocephalus*	IN-KL-07, 08, 12, 23
Ferruginous Duck *Aythya nyroca*	IN-KL-07, 23
Grey-headed Fish-eagle *Ichthyophaga ichthyaetus*	IN-KL-01, 03, 12, 13, 14, 15, 16, 17, 19, 20, 21, 22, 23, 24
Lesser Fish-eagle *Ichthyophaga humilis*	IN-KL-03, 13, 14, 15, 16, 17, 18, 19, 21, 22, 24, 28, 30, 33
Cinereous Vulture *Aegypius monachus*	IN-KL-08
Pallid Harrier *Circus macrourus*	IN-KL-01, 02, 05, 06, 08, 12, 17, 20, 21, 24, 25
Eurasian Curlew *Numenius arquata*	IN-KL-08
Black-tailed Godwit *Limosa limosa*	IN-KL-07, 08, 23
River Tern *Sterna aurantia*	IN-KL-03, 06, 07, 08, 09, 12, 14, 15, 17, 19, 22, 23, 28
European Roller *Coracias garrulous*	IN-KL-23
Malabar Pied Hornbill *Anthracoceros coronatus*	IN-KL-01, 02, 03, 10, 12, 14, 17, 18, 20, 21, 22, 24, 28, 30, 33(?)
Great Pied Hornbill *Buceros bicornis*	IN-KL-01, 03, 06, 09, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 24, 25, 27, 28, 30, 33
Grey-headed Bulbul *Pycnonotus priocephalus*	IN-KL-01, 02, 04
Banasura (Grey-breasted) Laughingthrush *Strophocincla fairbanki*	IN-KL-02, 05, 13, 16, 19
Kerala Laughingthrush *Strophocincla fairbanki*	IN-KL-04, 05, 12, 17, 18, 25, 26, 28, 29, 31, 32, 34
Tytler's Leaf Warble *Phylloscopus tytleri*	IN-KL-02, 05, 17, 20, 25, 26, 27, 31, 33, 34
Black-and-Orange Flycatcher *Ficedula nigrorufa*	IN-KL-01, 02, 05, 09 12, 13, 14, 16, 17, 19, 20, 25, 26, 27, 28, 29, 31, 32, 33, 34
Nilgiri Flycatcher *Eumyias Albicaudata*	IN-KL-01, 02, 03, 05, 06, 09, 11, 12, 13, 14, 15, 16, 17, 19, 20, 21, 22, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34

& Narayanan (2014) added 32 more species apart from an additional eight species which were historically recorded from Kerala. As on 31 March 2015, the total checklist of birds of Kerala stands at 500 (Praveen 2015).

Among the Critically Endangered species, the White-rumped Vulture *Gyps bengalensis*, Indian Vulture *Gyps indicus* and Red-headed Vulture *Aegypius calvus* are present in small numbers in Wayanad WLS bordering Mudumalai in Tamil Nadu and Bandipur in Karnataka (Sashikumar *et al*. 2011).

BirdLife International (2014) has listed 19 Endangered species in India, out of which nine are found in Kerala. Historically, the Endangered Egyptian Vulture *Neophron percnopterus* was not uncommon, but now very few records are available in the state. Though Black-bellied Tern *Sterna acuticauda* is reported from two IBAs in Kerala, they survive as a small population on the river bed of Bharathapuzha river (Sashikumar *et al.* 2011) lying at the northern extreme of Kole wetlands.

In Kerala, 13 out of 54 Vulnerable species listed for India by BirdLife International (2014) are found. All are found in the IBAs.

BirdLife International (2014) has listed 81 Near Threatened bird species for India, 32 of them occur in Kerala. The IBAs and protected areas of Kerala are extremely important for the long-term survival of seven bird species. In the biome classification done by BirdLife International (undated), Kerala lies in Biome-10 (Indian Peninsula Tropical Moist Forest), where 15 species are considered as representative of this biome. All of them are found in Kerala. Like in any other state, birds of other biomes, such as Biome-5 (Eurasian High Montane-Alpine and Tibetan), Biome-7 (Sino-Himalayan Temperate Forest), Biome-8 (Sino-Himalayan Subtropical Forest) and Biome-11 (Indo-Malayan Tropical Dry Zone) are also found, most as migratory birds. In the case of Biome-11, BirdLife International (undated) has listed 59 species, out of which 48 are found in Kerala. However, most of the birds of this biome are common and widespread, so their occurrence in Kerala is not surprising.

SUDHIR SHIVARAM

White-bellied Blue Robin *Myiomela albiventris* is one of the 25 endemic bird species of Kerala

THREATENED BIRDS FOR WHICH KERALA IS EXTREMELY IMPORTANT

Blue Robins/Shortwings
Endangered

Earlier two subspecies of *Brachypteryx major* were recognized: Rufous-bellied Shortwing *Brachypteryx major major* (nominate) of the Nilgiris, Brahmagiris and adjacent hill ranges as far north as the Bababudans of West Kerala, and White-bellied Shortwing *Brachypteryx major albiventris* of Kerala and Western Tamil Nadu, with Palghat gap being the geographical barrier. Recently, Rasmussen and Anderton (2005, 2012) have uplisted both of them as full species, and also placed them in genus *Myiomela*. Even common name of species has been changed. Now they are known as Nilgiri Blue Robin *Myiomela major* found in Karnataka, Kerala (Silent Valley) and Tamil Nadu; and White-bellied Blue Robin *Myiomela albiventris* of Kerala and Tamil Nadu.

Laughingthrushs *Strophocincla* spp.
Endangered

Taxonomic changes have taken place in this species. The monotypic Nilgiri Laughingthrush *Garrulax cachinnans* that is now Endangered, is now placed in genus *Strophocincla* and has been divided in to two species by Rasmussen and Anderton (2012): Black-chinned Laughingthrush *Strophocincla cachinnans* and Kerala Laughingthrush *Strophocincla fairbanki*. However, Naeer and Praveen (2012), Praveen and Nameer (2013) have identified four species of *Strophocincla* from the Western Ghats, and all four are found in Kerala: Banasura Laughingthrush *Strophocincla jerdoni*; Nilgiri Laughingthrush *Strophocincla cachinnans*; Palni Laughingthrush *Strophocincla fairbanki*; and Travancore Laughingthrush *Strophocincla meridionale*. All four species have very restricted distribution. Nameer and Praveen (2012) have suggested to consider Banasura Laughingthrush as Critically Endangered, Nilgiri Laughingthrush and

ENDEMIC BIRD AREA 123: WESTERN GHATS	
Malabar or Blue-winged Parakeet *Psittacula columboides*	
ENDEMIC BIRD AREA 123: WESTERN GHATS	
Nilgiri Woodpigeon *Columba elphinstonii*	IN-KL-01, 02, 05, 06, 09, 11, 12, 13, 14, 16, 17, 18, 19, 20, 21, 24
Grey-fronted Green-pigeon *Treron affinis*	IN-KL-01, 02, 03, 06, 10, 12, 13, 15, 16, 20, 22
Nilgiri Imperial-pigeon *Ducula cuprea*	IN-KL-02, 10, 20
Malabar Parakeet *Psittacula columboides*	IN-KL-01, 02, 03, 04, 05, 06, 10, 11, 12, 13, 14, 15, 16,17, 18, 19, 20, 21, 22, 23, 24, 25, 27, 28, 30, 31, 32, 33
Malabar Grey Hornbill*Ocyceros griseus*	IN-KL-01, 02, 03, 04, 05, 06, 09, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 24, 25, 27, 28, 30, 31, 33
Malabar Barbet *Megalaima malabarica*	IN-KL-01, 02, 03, 06, 10, 12, 13, 15, 16, 17, 19, 20, 21, 22, 24, 27, 30, 33
Malabar Woodshrike *Tephrodornis sylvicola*	IN-KL-01, 03, 15, 21, 22
Nilgiri Pipit *Anthus nilghiriensis*	IN-KL-04, 05, 10, 11, 12, 13(?), 17, 19, 24
Grey-headed Bulbul *Pycnonotus priocephalus*	IN-KL-01, 02, 03, 05, 10, 11, 13, 17, 19, 20, 21, 22, 24
Flame-throated Bulbul *Pycnonotus gularis*	IN-KL-03, 04, 06,13, 15, 16, 21, 22
White-bellied Blue Robin *Myiomela albiventris*	IN-KL-11, 13,16, 17, 19, 25, 26, 29, 32, 34.
Nilgiri Blue Robin *Myiomela major*	IN-KL-02, 05, 20, 27, 33
Malabar Woodshrike *Tephrodornis sylvicola*	IN-KL-01, 03, 04, 06, 15, 21, 22.
Wynaad Laughingthrush *Garrulax* (*Dryonastes*) *delesserti*	IN-KL-02, 06, 10, 11, 12, 13, 14, 15, 17, 19, 20, 21, 24
Nilgiri (Black-chinned) Laughingthrush *Strophocincla cachinnans*	IN-KL-01, 02, 20, 24
Banasura (Grey-breasted) Laughingthrush *Strophocincla jerdoni*	IN-KL-02, 05, 13, 20, 24
Palni (Kerala) Laughingthrush *Trochalopteron fairbanki*	IN-KL-04, 05
Indian Rufous Babbler *Turdoides subrufus*	IN-KL-01, 02, 03, 04, 05, 06, 10, 11, 12, 13, 14, 15, 17, 20, 21, 22, 24
Nilgiri Thrush *Zoothera neilgherriensis*	IN-KL-01, 05
Indian Broad-tailed Grass-warbler *Schoenicola platyurus*	IN-KL-05, 06, 10, 12, 13, 15, 16, 17, 18, 19, 20, 21, 24, 27, 33
Black-and-Orange Flycatcher *Ficedula nigrorufa*	IN-KL-02, 04, 05, 12, 17, 20, 24
Nilgiri Flycatcher *Eumyias albicaudata*	IN-KL-01, 02, 03, 05, 06, 11, 12, 13, 17, 19, 20, 24
White-bellied Blue Flycatcher *Cyornis pallipes*	IN-KL-01, 02, 03, 04, 05, 06, 10, 11, 12, 13, 17, 19, 20, 21, 22, 24
Nilgiri Flowerpecker *Dicaeum concolor*	IN-KL-01, 03, 04, 06
Small (Crimson-backed) Sunbird *Leptocoma minima*	IN-KL-01, 02, 03, 04, 05, 06, 10, 11, 12, 13, 14, 15, 17, 19, 20, 21, 24
Malabar Starling *Sturnia blythii*	IN-KL-01, 03, 06, 13, 15, 16, 21, 22
White-bellied Treepie *Dendrocitta leucogastra*	IN-KL-01, 02, 05, 06, 10, 11, 15, 17, 19, 20, 21, 22, 24

Travancore Laughingthrush as Endangered, and Palni Laughingthrush is Near Threatened.

Black-bellied Tern *Sterna acuticauda*
Endangered

It is widely distributed in India but recently BirdLife International (2014) added this species to the Endangered category because it is almost extinct in a large part of its range, but remain common in Indian Subcontinent. In Kerala it is found in Kole wetlands and Waynaad Wildlife sanctuary.

Nilgiri Wood-pigeon *Columba elphinstonii*
Vulnerable

This pigeon of the evergreen biotope is resident in Kerala. It is found from the foothills to the highest *sholas*, wherever tall fruiting trees are found (Ali 1969). It has been specifically reported from many IBAs and reserve forests.

Indian Broad-tailed Grassbird *Schoenicola platyurus*
Vulnerable

The Broad-tailed Grass-Warbler or Grassbird is restricted to grassy hillsides, principally in the Western Ghats, at least in the breeding season (BirdLife International 2014). In Kerala it is resident and not uncommon (Ali 1969) in Agasthyamalai, Cardamon, High Range and Anaimalai, between *c*. 900 and 2600 m. It has been specifically reported from Thirunelli (Zacharias and Gaston 1999); Wynaad (Davison 1883) and recently judged uncommon (Zacharias and Gaston 1999); Silent Valley National Park (Santharam, 1996, Gaston and Zacharias, 1996); Munnar (Zacharias and

DHRITIMAN MUKHERJEE

Out of the 25 Ramsar Sites in India, Kerala has four: Ashtamudi Lake, Kole (IBA), Sasthamkota Lake, and Vembanad (IBA). The Government of India and the Ramsar Convention have listed Vembanad-Kole wetlands as one Ramsar Site No. 1214, Wetland International Site Reference No. 21N019

Gaston 1999); Periyar Tiger Reserve (Robertson and Jackson 1992, Srivastava *et al*. 1993, Zacharias and Gaston 1999); and Agasthyamalai (Zacharias and Gaston 1999).

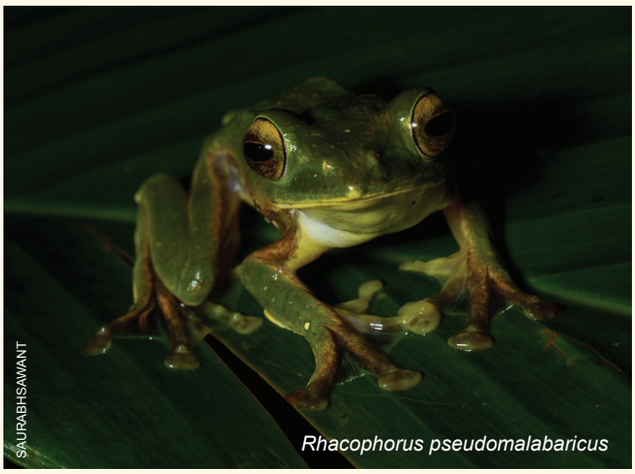
Restricted Range species

Kerala lies in the Western Ghats Endemic Bird Area (EBA 123) where Stattersfield (*et al*. 1998) had identified 16 bird species as endemic or Restricted Range. Based on the new taxonomic changes, there are now 26 endemic species in the Western Ghats, and 25 of them are found in Kerala. For many Restricted Range species, the IBAs of Kerala are extremely important for long-term survival.

THREATS AND CONSERVATION ISSUES

The State has a long history of conservation and protecting wild animals and birds. Sacred groves have existed in India from time immemorial as patches of densely wooded areas, and are venerated as religious grounds. In Kerala, it is common among Hindus to assign a part of their land as the abode of goddess '*Durga*' or the serpent god '*Naga*'. These sacred grooves have preserved many rare and endemic plants, animals, and birds.

The anthropogenic pressure on the forests in Kerala is very intense. To ensure the survival of endemic threatened species, it is vital to protect and maintain the Evergreen and Semi-evergreen Forests of the State. Kerala's plant biodiversity faces a severe threat from 89 alien invasive species, which were recorded in a survey commissioned by the Kerala State Biodiversity Board. Of these, 19 present a high risk; many were found displacing and destroying a large number of native species, causing environmental and economic loss.



Important Bird and Biodiversity Areas (IBAs) perfectly fit the criteria of Key Biodiversity Area concept being developed by IUCN as they protect all types of biota, not only birds. The IBAs and PAs of Kerala have more than 80 species of frogs and toads, most of them endemic to the Western Ghats and some to Kerala. As per the present knowledge, there are 36 known species of amphibians which are endemic to Kerala. The two monotypic genera of frogs, *Mercurana myristicapalustris* and *Beddomixalus bijui* are only known from Kerala. Some other representative examples are *Micrixalus gadgili*, *Nyctibatrachus minumus*, *Raorchestes kadalarensis*.

Sashikumar *et al*. (2011) have listed many conservation issues of the state. They found that there is a decreasing trend of habitat specialist species, while generalist species are spreading. Birds of the low altitude evergreen forests seem to have suffered the most in Kerala, mainly due to human interventions. Species such as Malabar Pied Hornbill *Anthracoceros coronatus*, a Near Threatened species, has declined, along with Orange-breasted Green-pigeon *Treron bicinctus*.

Habitat fragmentation in high altitude areas is a major cause of concern as many species have nowhere to go. These 'sky islands' are now surrounded by tea estates or plantations, leaving very limited habitat for species such as White-bellied Blue Robin, Nilgiri Blue Robin, and Black-and-Orange Flycatcher.

According to Sashikumar *et al*. (2011), perhaps the most seriously affected bird community is that of the species occurring in dry fallow land, scrub jungle and laterite hillocks. These habitats are fast disappearing under development process or converted to agriculture or severely overgrazed.

Wetlands in Kerala are under extreme pressure due to the high population density of the State. For example, as much as two-thirds of the Vembanad Lake has been either reclaimed as land or converted into fields for agricultural and fishery activities (Gopalan 1991). Wetlands in Kerala are mainly used for agriculture, pisciculture, and reclamation for housing and industrial purposes. In addition, the wetlands are used for disposing of waste materials, and for discharging industrial effluents and municipal waste water, for wood seasoning, for feeding water for ducks, dumping dredged soil, coir retting and for hunting and fishing (Balachandran *et al*. 2002).

The rivers of Kerala have been harnessed for several hydroelectric projects such as Pallivasal, Sabarigiri and Idukki and for irrigation projects like Malampuzha, Periyar Valley, Peechi and Kallada (Vijayan and Balakrishnan 1977). In Kerala, there are 250 polluting large and medium-scale industries and about 2,000 polluting small-scale industries. Most of these industries draw water from the rivers and discharge effluents into them (Venugopalan Nair 1997; Aziz and Nair 1987).

The ecological status of mangroves is not well appreciated. The indiscriminate exploitation of mangroves for timber, poles and firewood is considered as the major cause of mangrove depletion. A glaring example is the Vembanad wetland region, once, a large mangrove swamp, (two decades ago). At present it is modified into settlements, agricultural fields and filtration ponds.

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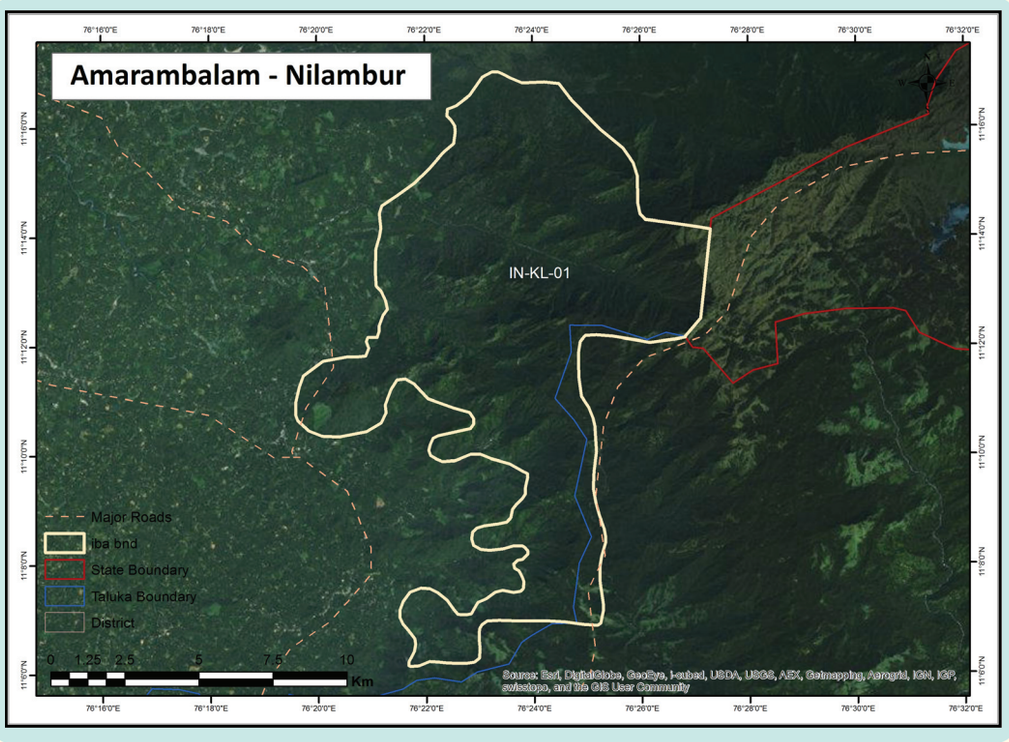
NEW AMARAMBALAM RESERVE FOREST-NILAMBUR

IBA Site Code	:	IN-KL-01	**Rainfall**	: >3,000 mm
Administrative Region (State)	:	Kerala	**Temperature**	: 21 °C to 38 °C
District	:	Malappuram	**Biogeographic Zone**	: Western Ghats
Coordinates	:	11° 13' 60" N, 76° 10' 60" E	**Habitats**	: West Coast Tropical Evergreen Forest, West Coast Tropical Semi-evergreen Forest, Southern Tropical Moist Deciduous Forest, Southern Subtropical Broadleaf Forest
Ownership	:	State		
Area	:	26,572 ha		
Altitude	:	40–2,554 msl		

IBA CRITERIA: A1 (Threatened species), A2 (Endemic Bird Area 123: Western Ghats), A3 (Biome 10: Indian Peninsula Tropical Moist Forest)

PROTECTION STATUS: Reserve Forests, notified 1898; part of Biosphere Reserve since 1986.



GENERAL DESCRIPTION

New Amarambalam Reserve Forest is one of the largest reserve forests of Kerala. It was notified as a reserve forest as early as 1898. The forest has very high altitudinal gradation, from 40 m to 2,554 m. This, coupled with high rainfall, makes for a dense forest cover. This reserve forest is contiguous with the Silent Valley National Park (an IBA), Mukurthi National Park (an IBA) in Tamil Nadu, and forms part of the core area of Nilgiri Biosphere Reserve since 1986 (Sharma *et al*. 2000).

AVIFAUNA

New Amarambalam RF forms part of the Nilambur South Forest Division. A bird survey in 1993 reported 189 species of birds from Nilambur Forest Division, including New Amarambalam RF (Nameer 1993). Subsequently, Nameer *et al*. (2011) recorded 170 species of birds from the Nilambur South Forest Division in a four-day bird survey in December, 2008. The site lies in the Western Ghats Endemic Bird Area (Stattersfield *et al*. 1998), where 26 restricted-range species have been identified. Of these, 17 species have been sighted in this IBA. One Endangered and three Vulnerable species are also known to occur.

BirdLife International (2014) identified 81 Near Threatened species in India; five of them are found in this IBA, but more are likely to be found.

New Amarambalam RF lies in Biome 10 (Indian Peninsula Tropical Moist Forest), as classified by BirdLife International (undated). In this biome, 15 bird species have been identified, of which 12 species are found in this IBA.

Interestingly, Nameer *et al*. (2011) have seen 11 species of woodpeckers, three species of barbets, seven species of bulbuls, seven species of babblers, and 12 species of flycatchers. This demonstrates that the habitat, at least for birds, is still intact in this site.

OTHER KEY FAUNA

The diverse habitats of Nilambur harbour rich mammalian fauna. These forests, along with the adjoining Wayanad and Silent Valley, and the Nilgiris, form a very important refuge for Asiatic Elephant *Elephas maximus*. Other large mammals are Gaur *Bos gaurus*, Wild Boar *Sus scrofa*, Sambar *Rusa unicolor*, Barking Deer *Muntiacus muntjac*, Indian Crested Porcupine *Hystrix indica*, Indian Pangolin *Manis crassicaudata*, and Mouse Deer *Moschiola indica*. The large carnivores present are Tiger *Panthera tigris*, Leopard *P. pardus*, Sloth Bear *Melursus ursinus*, and Wild Dog *Cuon alpinus*, while the small carnivores include Jungle Cat *Felis chaus*, Small Indian Civet *Viverricula indica*, Toddy Cat *Paradoxurus hermaphroditus*, Common Mongoose *Herpestes edwardsi*, and Stripe-necked Mongoose *Herpestes vitticollis*.

VINAYAK YARDI

Out of 26 restricted-range species in the Western Ghats, 17 species have been sighted in this IBA, including the Nilgiri Wood-pigeon *Columba elphinstonii*

ENDANGERED	
Nilgiri Laughingthrush	*Strophocincla cachinnans*
VULNERABLE	
Lesser Adjutant	*Leptoptilos javanicus*
Nilgiri Wood-pigeon	*Columba elphinstonii*
Asian Woollyneck	*Ciconia episcopus*
NEAR THREATENED	
Great Pied Hornbill	*Buceros bicornis*
Malabar Pied Hornbill	*Anthracoceros coronatus*
Grey-headed Bulbul	*Microtarsus priocephalus*
Nilgiri Flycatcher	*Eumyias albicaudatus*
ENDEMIC BIRD AREA 123: WESTERN GHATS	
Nilgiri Wood-pigeon	*Columba elphinstonii*
Grey-fronted Green-pigeon	*Treron affinis*
Malabar Grey Hornbill	*Ocyceros griseus*
Malabar Barbet	*Megalaima malabarica*
Malabar Parakeet	*Psittacula columboides*
Malabar Woodshrike	*Tephrodornis sylvicola*
White-bellied Treepie	*Dendrocitta leucogastra*
Grey-headed Bulbul	*Microtarsus priocephalus*
Indian Rufous Babbler	*Turdoides subrufa*
Wynaad Laughingthrush	*Dryonastes delesserti*
Nilgiri Laughingthrush	*Strophocincla cachinnans*
Malabar Starling	*Sturnia blythii*
Nilgiri Thrush	*Zoothera neilgherriensis*
White-bellied Blue Flycatcher	*Cyornis pallipes*
Nilgiri Flycatcher	*Eumyias albicaudatus*
Nilgiri Flowerpecker	*Dicaeum concolor*
Small Sunbird	*Leptocoma minima*
BIOME 10: INDIAN PENINSULA TROPICAL MOIST FOREST	
Blue-faced Malkoha	*Phaenicophaeus viridirostris*
Jerdon's Nightjar	*Caprimulgus atripennis*
Indian Swiftlet	*Collocalia unicolor*
Malabar Trogon	*Harpactes fasciatus*
White-cheeked Barbet	*Megalaima viridis*
Malabar Barbet	*Psilopogon malabarica*
Yellow-browed Bulbul	*Acritillas indica*
Malabar Whistling-thrush	*Myophonus horsfieldii*
Indian Scimitar-babbler	*Pomatorhinus horsfieldii*
Dark-fronted Babbler	*Rhopocichla atriceps*
Loten's Sunbird	*Cinnyris lotenius*
Black-throated Munia	*Lonchura kelaarti*

The arboreal mammals include Nilgiri Langur *Semnopithecus johnii*, Lion-tailed Macaque *Macaca silenus*, Bonnet Macaque *M. radiata*, Grey Slender Loris *Loris lydekkerianus*, and Malabar Giant Squirrel *Ratufa indica*, the first three being endemic to the Western Ghats. Other endemics like Malabar Spiny Dormouse *Platacanthomys lasiurus* and Nilgiri Marten *Martes gwatkinsii* are also known from the locality. Large herds of Nilgiri Tahr *Nilgiritragus hylocrius* are often observed in the high altitude montane grasslands of New Amaramblam RF adjoining Mukurthi NP.

The south division of Nilambur is known for the settlement of the Cholanaikan, one of the most primitive tribal communities in southern India. They live in the dense forested tracts of New Amarambalam RF.

P.O. NAMEER

New Amarambalam Reserve Forest, a part of the Nilambur south forest division, has Tropical Evergreen Forest, Tropical Semi-evergreen Forest, Tropical Moist Deciduous Forest and Subtropical Broadleaf Forest

LAND USE

- Forestry

THREATS AND CONSERVATION ISSUES

Data Deficient.

KEY CONTRIBUTOR

P.O. Nameer

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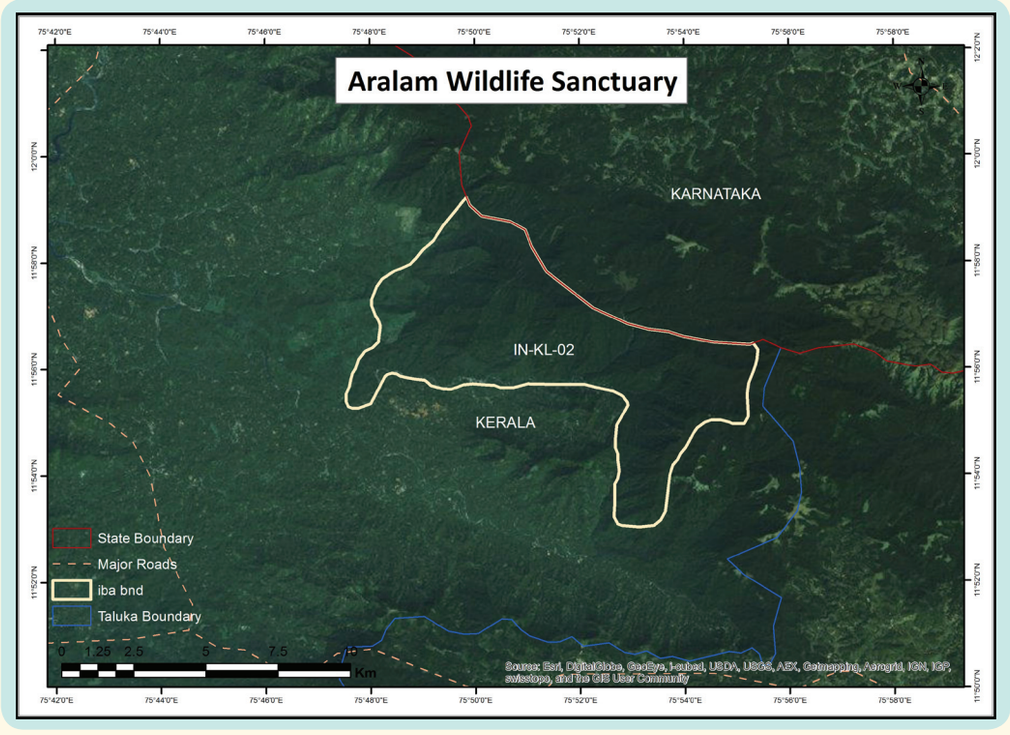
ARALAM WILDLIFE SANCTUARY

IN-KL-02

IBA Site	: IN-KL-02	**Altitude**	: 50–1,489 msl
Administrative Region (State)	: Kerala	**Rainfall**	: 4,000 mm
District	: Kannur	**Temperature**	: 8 ºC to 40 ºC
Coordinates	: 11º 59' 140" N, 75º 55' 58" E	**Biogeographic Zone**	: Western Ghats
Ownership	: State	**Habitats**	: Tropical Wet Evergreen Forest, Tropical Semi-evergreen Forest
Area	: 5,500 ha		

IBA CRITERIA: A1 (Threatened species), A2 (Endemic Bird Area 123: Western Ghats)
A3 (Biome 10: Indian Peninsula Tropical Moist Forest)

PROTECTION STATUS: Wildlife Sanctuary, established October, 1984.



GENERAL DESCRIPTION

Aralam Wildlife Sanctuary, which lies in the southeastern side of Kannur district, Kerala, is a compact 55 sq. km area with rich floral and faunal diversity. The sanctuary lies between Aralam and Kottiyoor villages. The nearest railhead is at Thalassery (formerly Tellicherry), about 70 km from the sanctuary. The area is well connected by road to Thalassery, Kannur, Wayanad, and Veerajpetta (Menon 1999).

Biogeographically, Aralam Wildlife Sanctuary is located in the Western Ghats. Though the sanctuary is not included in the Nilgiri Biosphere Reserve, it has all the characteristic important endemics of the Western Ghats (Menon 1999).

The primary vegetation of this IBA is evergreen forest, but in the disturbed areas such as Valayanchal and Kurukkathodu, there are many deciduous trees, making the forest semi-evergreen (Pramod *et al*. 2011).

Aralam Wildlife Sanctuary is the only protected area containing West Coast Tropical Evergreen Forest of *Dipterocarpus-Mesua-Palaquium* type (Nair 1991). Less than 25 sq. km of fairly undisturbed forest of this type is included in this sanctuary. Paripputhodu (towards Uruppukunnu), Uruppukunnu, Kannadivechakunnu, and the whole stretch of forest from Chavachi to Ambalapara are good representatives of this forest type. *Dipterocarpus*, *Calophyllum*, and *Palaquium* dominates in Uruppukunnu. In the upper regions of the sanctuary, four different tree associations can be seen. In the upper reaches of Ambalapara, stunted evergreen forest with dominance of species of the Family Lauraceae is found. It is similar to the shola grassland vegetation of the upper reaches of the Western Ghats. At mid elevations, Wet Evergreen association of *Calophyllum-Palaquium-Myristica* is found.

Further down, we find *Dipterocarpus* dominated forests. About 4.5 sq. km is under teak, eucalyptus, and cashew plantations, now without forestry operations, and therefore overgrown with secondary growth (Pramod *et al*. 2011).

AVIFAUNA

235 species of birds have been recorded (Sashikumar *et al*. 2014). Twelve globally Threatened species, 15 species endemic to the Western Ghats, and 21 species of Schedule I of the Indian Wildlife (Protection) Act, 1972 have been reported. Malabar Pied Hornbill *Anthracoceros coronatus*, a Near Threatened species according to BirdLife International (2014), is regularly observed in Paripputhodu region with a maximum group size of 17 individuals. Great Pied Hornbill *Buceros bicornis* and Malabar Grey Hornbill *Ocyceros griseus* are also found in the sanctuary. Nesting of Malabar Grey Hornbill and Malabar Pied Hornbill has been recorded (Pramod *et al*. 2011). Nilgiri Pipit *Anthus nilghiriensis* has been reported from the Ambalapara area in the sanctuary, but needs confirmation.

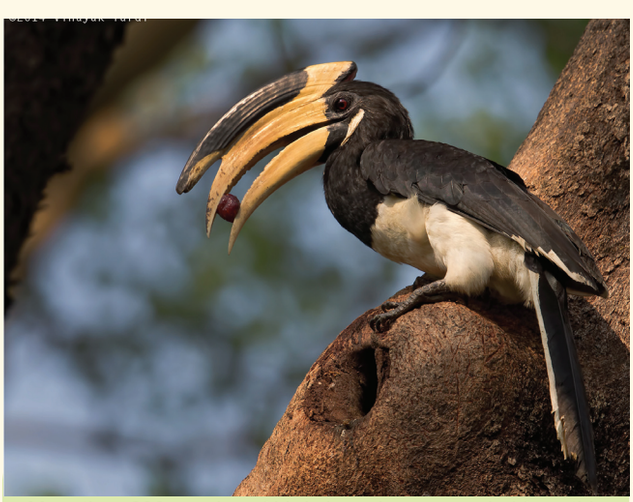
CRITICALLY ENDANGERED	
White-rumped Vulture	*Gyps bengalensis*
Red-headed Vulture	*Aegypius calvus*
ENDANGERED	
Banasura Laughingthrush	*Strophocincla jerdoni*
Nilgiri Blue Robin	*Myiomela major*
VULNERABLE	
Nilgiri Wood-pigeon	*Columba elphinstonii*
NEAR THREATENED	
Oriental Darter	*Anhinga melanogaster*
Pallid Harrier	*Circus macrourus*
Malabar Pied Hornbill	*Anthracoceros coronatus*
Grey-headed Bulbul	*Microtarsus priocephalus*
Tytler's Leaf-warbler	*Phylloscopus tytleri*
Black-and-Orange Flycatcher	*Ficedula nigrorufa*
Nilgiri Flycatcher	*Eumyias albicaudatus*
ENDEMIC BIRD AREAS 123: WESTERN GHATS	
Nilgiri Wood-pigeon	*Columba elphinstonii*
Grey-fronted Green-pigeon	*Treron affinis*
Nilgiri Imperial-pigeon	*Ducula cuprea*
Malabar Parakeet	*Psittacula columboides*
Malabar Grey Hornbill	*Ocyceros griseus*
Malabar Barbet	*Psilopogon malabaricus*
Grey-headed Bulbul	*Microtarsus priocephalus*
Wynaad Laughingthrush	*Dryonastes delesserti*
Banasura Laughingthrush	*Strophocincla jerdoni*
Indian Rufous Babbler	*Turdoides subrufus*
Nilgiri Blue Robin	*Myiomela major*
Black-and-Orange Flycatcher	*Ficedula nigrorufa*
Nilgiri Flycatcher	*Eumyias albicaudatus*
White-bellied Blue Flycatcher	*Cyornis pallipes*
Small Sunbird	*Leptocoma minima*
White-bellied Treepie	*Dendrocitta leucogastra*

A population of five restricted-range species (endemics): Nilgiri Wood-pigeon *Columba elphinstonii*, Black-and-Orange Flycatcher *Ficedula nigrorufa*, Nilgiri Blue Robin *Myiomela major*, Nilgiri Flycatcher *Eumyias albicaudatus* and Banasura Laughingthrush *Strophocincla jerdoni*, is reported from the eastern highlands of the Ambalapara region. A total of 13 Western Ghats endemic bird species are reported from this site. These endemic birds, along with the Square-tailed (Black) Bulbul *Hypsipetes ganeesa*, Grey-headed Flycatcher *Culicicapa ceylonensis*, Oriental White-eye *Zosterops palpebrosus*, and Tytler's Leaf -warbler *Phylloscopus tytleri* are regularly seen in the Ambalapara region.

Black Baza *Aviceda leuphotes*, Rufous-bellied Eagle *Hieraaetus kienerii*, Sri Lanka Frogmouth *Batrachostomus moniliger*, and Oriental Broad-billed Roller *Eurystomus orientalis* are the other uncommon birds recorded from this IBA. The Critically Endangered White-rumped *Gyps bengalensis* and Red-headed *Sarcogyps calvus* Vultures have occasionally been recorded, probably visitors from the adjacent Wayanad area, where they are known to occur.

OTHER KEY FAUNA

The sanctuary is very well protected and conducive to the presence of animal populations. Most of the animals seen in the nearby Wayanad Wildlife Sanctuary are also sighted here. No census has been conducted in the sanctuary and therefore a realistic figure regarding the animal population is not available, but the following mammals are commonly seen: Bonnet Macaque *Macaca radiata*, Lion-tailed Macaque *M. silenus*, Nilgiri Langur *Semnopithecus johnii*, Grey Slender Loris *Loris lydekkerianus*, Tiger *Panthera tigris*, Leopard *Panthera pardus*, Jungle Cat *Felis chaus*, civets, mongoose, Wild Dog *Cuon alpinus*, Asiatic Elephant *Elephas maximus*, and Gaur *Bos gaurus*. Thirty-three species of fish



VINAYAK YARDI

More than 230 species of birds have been recorded from this IBA, including 12 Threatened and Near Threatened species. Malabar Pied Hornbill *Anthracoceros priocephalus* is one of the Near Threatened species

P.O. NAMEER

Aralam Wildlife Sanctuary is the only protected area that bears West Coast Tropical Evergreen Forest of *Dipterocarpus-Mesua-Palaquium* type

were recorded from this site (Shaji *et al*. 1995), including many which are endemic to the Western Ghats. The butterfly population has been well documented; Malabar Natural History Society conducts annual monitoring of butterfly migration in the sanctuary.

LAND USE

- Forestry
- Tourism

THREATS AND CONSERVATION ISSUES

- Poaching
- Firewood collection

Except for firewood collection and some poaching, there is no major irreversible threat to this IBA. In 2007, more than one thousand tribal families from different parts of Kerala were settled in 3,060 acres of land purchased by the Kerala government from the Central State Farm adjacent to the sanctuary. There is no buffer zone between the settlement and the sanctuary, and this has led to increased and recurrent conflict with the wildlife.

A sizeable number of the tribals and other local people can get seasonal employment in the sanctuary for fire protection activities. Tourist traffic also can provide extra employment to a number of people, provided this is planned thoroughly; uncontrolled tourist influx to high altitude areas like Ambalapara could be detrimental to this unique ecosystem.

KEY CONTRIBUTORS

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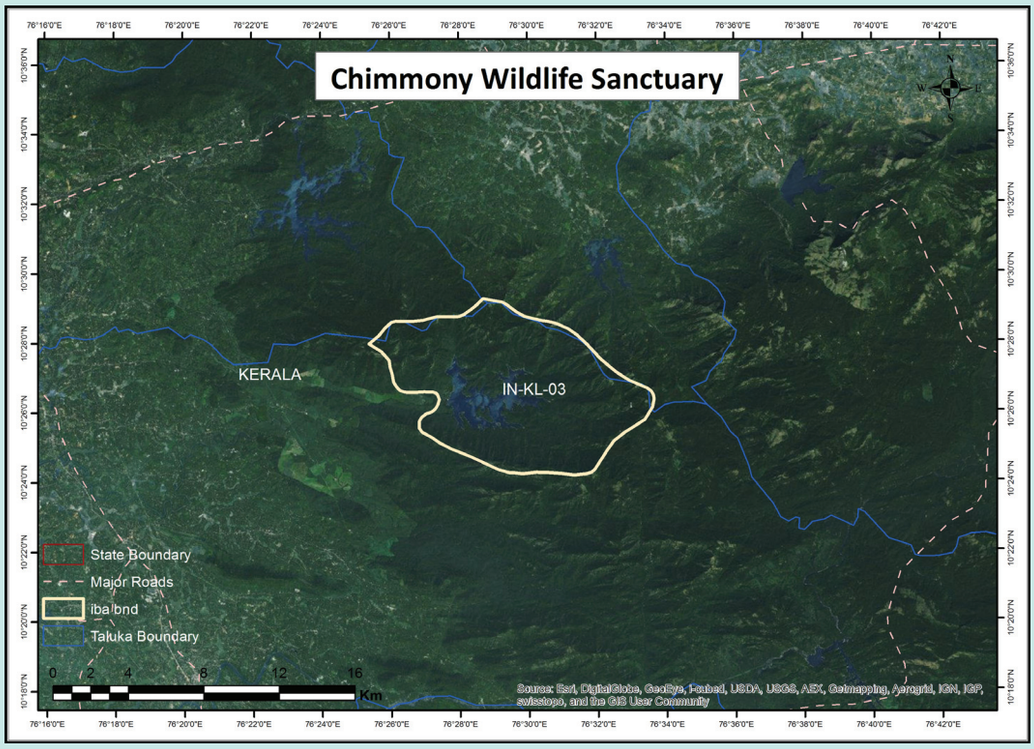
CHIMMONY WILDLIFE SANCTUARY

IBA Site code	: IN-KL-03	**Rainfall**	: 2,980 mm
Administrative Region (State)	: Kerala	**Temperature**	: 15 ºC to 36 ºC
District	: Trichur	**Biogeographic Zone**	: Western Ghats
Coordinates	: 10º 24' 19" N, 76º 35' 55"E	**Habitats**	: West Coast Tropical Evergreen Forest, West Coast Semi-evergreen Forest, Southern Indian Moist Deciduous Forest, Teak Plantation
Ownership	: State		
Area	: 9,000 ha		
Altitude	: 1,126–2,500 msl		

IBA CRITERIA: A2 (Endemic Bird Area 123: Western Ghats), A3 (Biome 10: Indian Peninsula Tropical Moist Forest)

PROTECTION STATUS: Wildlife Sanctuary, established August, 1984.



GENERAL DESCRIPTION

Chimmony Wildlife Sanctuary, situated east of the Parambikulam Tiger Reserve, is of considerable ecological importance. It forms a continuous stretch of natural forests with Parambikulam TR. It is one of the westernmost segments of the proposed Anamalai-Anamudi Conservation Unit, which starts from Chinnar WLS in the east and stretches to Peechi WLS, as a continuous belt. The landforms of the sanctuary have extremely varying topography. The boundary of the sanctuary roughly coincides with the watershed of the Chimmony river (Menon 1997). The innumerable channels of the river have carved the entire landscape into a diverse topography that it is unique to this region.

The climate is fairly equable in the sanctuary. The dry season extends from December to April-May, and the wet season from June to November. The hottest months are March, April, and May. The bulk of the annual rainfall comes from the southwest monsoon. The tract receives an average rainfall of *c.* 2,980 mm annually.

Chimmony Wildlife Sanctuary consists of West Coast Tropical Wet Evergreen Forest, West Coast Semi-evergreen Forest, Moist Deciduous Forest, and Teak plantations nearly 35 years old (Champion & Seth 1968, Jayson 1999). The Evergreen Forest is composed of *Palaquium ellipticum*, *Calophyllum tomentosum*, *Cullenia exarillata*, *Dipterocarpus indicus*, *Artocarpus hirsuta*, *Bombax*

NEAR THREATENED	
Oriental Darter	*Anhinga melanogaster*
Lesser Fish-eagle	*Ichthyophaga humilis*
River Tern	*Sterna aurantia*
Great Pied Hornbill	*Buceros bicornis*
Malabar Pied Hornbill	*Anthracoceros coronatus*
ENDEMIC BIRD AREA 123: WESTERN GHATS	
Malabar Parakeet	*Psittacula columboides*
Grey-fronted Green-pigeon	*Treron affinis*
Malabar Grey Hornbill	*Ocyceros griseus*
Malabar Barbet	*Megalaima malabarica*
Malabar Woodshrike	*Tephrodornis sylvicola*
Flame-throated Bulbul	*Pycnonotus gularis*
Malabar Starling	*Sturnia blythii*
Nilgiri Flowerpecker	*Dicaeum concolor*
Indian Rufous Babbler	*Turdoides subrufus*
White-bellied Blue Flycatcher	*Cyornis pallipes*
Small Sunbird	*Leptocoma minima*
BIOME 10: INDIAN PENINSULA TROPICAL MOIST FOREST	
Blue-faced Malkoha	*Phaenicophaeus viridirostris*
Sri Lanka Frogmouth	*Batrachostomus moniliger*
Indian Swiftlet	*Aerodramus unicolor*
Malabar Trogon	*Harpactes fasciatus*
White-cheeked Barbet	*Megalaima viridis*
Malabar Barbet	*Psilopogon malabaricus*
Malabar Whistling-thrush	*Myophonus horsfieldii*
Black-headed Babbler	*Rhopocichla atriceps*
Loten's Sunbird	*Cinnyris lotenius*

ceiba, and *Syzygium cumini*. The lower canopy consists of *Cinnamomum zeylanicum*, *Mallotus philippensis*, and *Zanthoxylum flavescens*. *Calamus travancoricus*, *Ixora* sp. and *Laportea crenulata* are seen in the undergrowth. According to Jayson (1999), most of the sanctuary consists of Moist Deciduous Forest, which merges with Semi-evergreen at higher elevations.

AVIFAUNA

A total of 177 species of birds were recorded in a survey conducted by the Nature Education Society, Trichur (NEST), in collaboration with the Kerala Forest Research Institute (Nameer 1992). Since then, two more bird surveys were done at Chimmony WLS in 2006 (Nameer & Nirmal 2007) and in 2014 (Praveen & Nameer, in prep.). Five Near Threatened and 11 restricted-range (endemic) species of the Western Ghats were recorded from these studies. The site lies in the Western Ghats Endemic Bird Area (Stattersfield *et al.* 1998), one of the biodiversity hotspots of the world.

This site comes under Biome 10 (Indian Peninsula Tropical Moist Forest), which is represented by 15 bird species. Based on the three bird surveys done until now (Nameer 1992, Nameer & Nirmal 2007, Praveen & Nameer, *in prep.*), nine of these biome species are found at Chimmony.

OTHER KEY FAUNA

The mammals seen in Chimmony Wildlife Sanctuary include Nilgiri Langur *Semnopithecus johnii*, Lion-tailed Macaque *Macaca silenus,* Grey Slender Loris *Loris lydekkerianus*, Leopard Cat *Prionailurus bengalensis*, Wild Dog *Cuon alpinus*, Indian Giant Squirrel *Ratufa indica*, Asiatic Elephant *Elephas maximus*, Gaur *Bos gaurus*, Sambar *Rusa unicolor*, Mouse Deer *Moschiola indica*, Wild Boar *Sus scrofa*, Indian Porcupine *Hystrix indica*, Leopard *Panthera pardus*, and Tiger *P. tigris* (Jayson 1997).

P.O. NAMEER

Chimmony river and its channels have carved the entire landscape into a diverse topography that is unique to this region

P.O. NAMEER

Chimmony Wildlife Sanctuary forms a continuous stretch of natural forest with Parambikulam Tiger Reserve

LAND USE

- Nature conservation

THREATS AND CONSERVATION ISSUES

The boundaries of Chimmony WLS were drawn on the basis of physical barriers, and ecological continuity was not considered. Extensive Evergreen and Semi-evergreen forests around the sanctuary, which harbour several Threatened species, do not come within the limits of any protected area (Kaler 1990). Beyond the eastern boundary of Chimmony lie the large tracts of evergreen forests of Parambikulam. To the south and southwest are the evergreen forests of Vazhachal and Chalakudy Forest Divisions. These areas have to be included in the Anamalai-Anamudi Conservation Unit, thus joining Chinnar and Indira Gandhi Wildlife Sanctuaries on the east to Peechi Wildlife Sanctuary on the west.

Chimmony WLS is free from human habitation, except for the former Kallichitra tribal settlement. This settlement was relocated when Chimmony Reservoir was filled up. There is no cultivation inside the sanctuary and the pressure of cattle grazing is also low.

KEY CONTRIBUTORS

P.O. Nameer, IBA Team, Sari.

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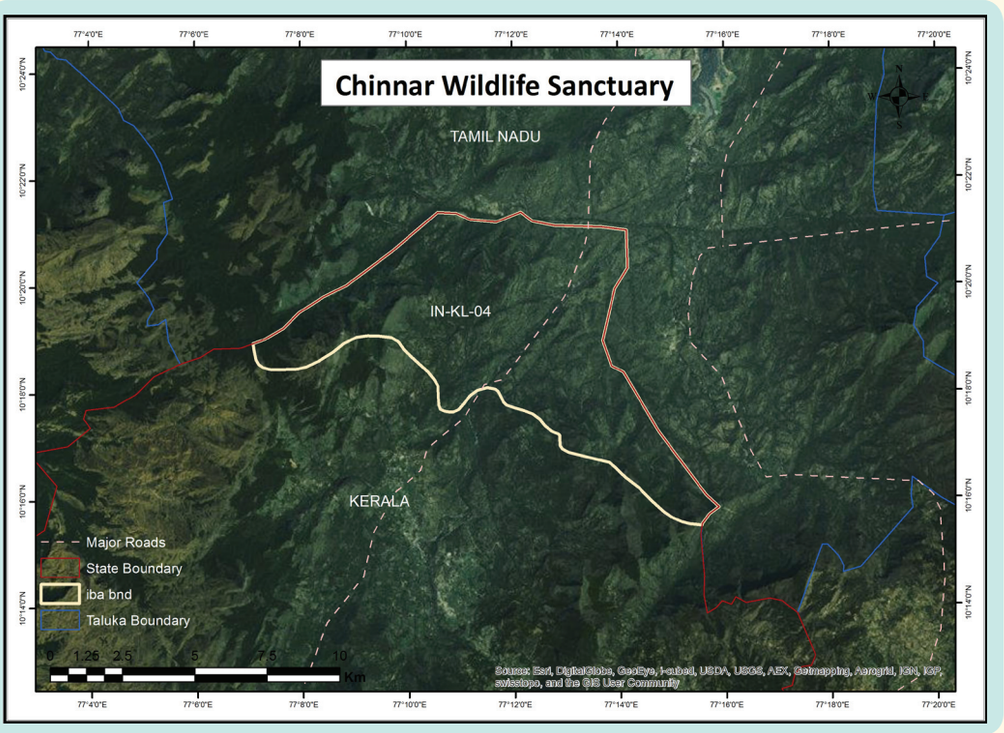
CHINNAR WILDLIFE SANCTUARY

IN-KL-04

IBA Site Code	: IN-KL-04	**Temperature**	: 12 ºC to 38 ºC
Administrative Region (State)	: Kerala	**Biogeographic Zone**	: Western Ghats
District	: Idukki	**Habitats**	: Southern Tropical Thorn Forest, Southern Dry Mixed Deciduous Forest, Southern Moist Mixed Deciduous Forest, Tropical Riparian Fringing Forest, Southern Montane Wet Temperate Forest, Southern Montane Wet Grassland
Coordinates	: 10º 20' 33" N, 77º 11' 45" E		
Ownership	: State		
Area	: 9,044 ha		
Altitude	: 400–2,400 msl		
Rainfall	: 500 mm		

IBA CRITERIA: A1 (Threatened species), A2 (Endemic Bird Area 123: Western Ghats), A3 (Biome 10: Indian Peninsula Tropical Moist Forest; Biome 11: Indo-Malayan Tropical Dry Zone)

PROTECTION STATUS: Wildlife Sanctuary, established October, 1984.



GENERAL DESCRIPTION

Chinnar Wildlife Sanctuary comprises an area of 9,044 ha along the rain shadow region of the Western Ghats. It was formerly known as Chinnar Reserve Forest and was part of Marayoor Range of Munnar Forest Division. Considering its ecological, faunal, floral, and geomorphological significance, it was declared as Chinnar Wildlife Sanctuary in 1984.

As Chinnar Wildlife Sanctuary is situated in the rain shadow region, it experiences prolonged hot/dry season and a brief monsoon. The Chinnar plains are generally hot, but the higher altitudes are cool. The major rainfall is received from the north-east monsoon which occurs during October-December. The rainy days in a year range between 30 to 40, which account for 300–500 mm rainfall in Chinnar and the adjacent areas. But the higher altitude areas like Olikkudy and Mangappara receive rain during both north-east and south-west monsoons, with much higher rainfall.

The importance of Chinnar Wildlife Sanctuary is enhanced by its proximity with Eravikulam National Park to the south and Indira Gandhi WLS to the north. It forms an integral part of the 1,187 sq. km block of protected forests straddling the Kerala-Tamil Nadu border in the Anamalai

Hills. Thus it serves as a corridor for the movement and dispersal of animals.

The vegetation can be described as Southern tropical thorn forest (Scrub), Southern dry mixed deciduous forest (Dry Deciduous Forest), Southern moist mixed deciduous forest (Moist Deciduous Forest), Tropical riparian fringing forest (Riparian Forest), Southern montane wet temperate forest (Hill Shola Forest), and Southern montane wet grassland (Grasslands). The dominant plant species of the sanctuary are *Chloroxylon swietenia*, *Anogeissus latifolia*, *Strychnos potatorum*, *Ixora arborea*, and various other xerophytic plants such as thorny acacias, opuntia, and euphorbia (Chandrashekara *et al*. 2002).

AVIFAUNA

Perhaps the first note published specifically on Chinnar birds is by Nameer & George (1991), who listed 116 species. During a two-day bird survey, Nameer (1996) recorded 128 species. Namassivayan (1999) conducted three elaborate bird surveys in spring, winter, and monsoon covering all parts of the sanctuary and observed 200 species, including the Yellow-throated Bulbul *Pycnonotus xantholaemus* (Praveen & Namassivayan 2006).

Thirteen endemic birds of the Western Ghats have been reported from Chinnar (Praveen & Nameer 2013). Interestingly, the globally Threatened Yellow-throated Bulbul *Pycnonotus xantholaemus*, an endemic to the boulder-strewn scrub forests of peninsular India (Ali & Ripley 1987, Grimmett *et al*. 1998) is found here. This is the only IBA in Kerala where the species is found (Praveen & Namassivayan 2006). Two Vulnerable and two Near Threatened species of birds are found at Chinnar (Praveen & Nameer 2013).

As the site lies in the Western Ghats, it comes under Biome 10 (Indian Peninsula Tropical Moist Forest), according to the classification of BirdLife International (undated). However, as it does not have thick forest cover, most of the birds listed in Biome 10 are not found here. Nevertheless, the following are seen: Blue-faced Malkoha *Phaenicophaeus viridirostris*, White-cheeked Barbet *Megalaima viridis*, and Malabar Barbet *Psilopogon malabaricus* (Nameer & George 1991, Praveen & Nameer 2013). Of the 59 species recorded as typical of Biome 11 (Indo-Malayan Tropical Dry Zone), 16 are seen in this IBA.

OTHER KEY FAUNA

Chinnar WLS, and Srivalliputtur Grizzled Giant Squirrel Sanctuary in Tamil Nadu are two important sites of the Grizzled Giant Squirrel *Ratufa macroura* (Ramachandran 1993). A 16 km public road connecting Munnar and Udumelpettu passes more or less through the middle of the sanctuary from Karimutty to Chinnar. Forest contiguity is broken in many places due to roads and 220 KV power lines, disrupting the movement of the Endangered Grizzled Giant Squirrel.

Another interesting species is the Starred Tortoise *Geochelone elegans*, an inhabitant of dry scrubland. It is listed in Schedule I of the Indian Wildlife (Protection) Act, and its presence in Chinnar is noteworthy, as it is not found in other parts of Kerala.

Other important mammals in the sanctuary are Tiger *Panthera tigris*, Leopard *P. pardus*, Asiatic Elephant *Elephas maximus*, Gaur *Bos gaurus*, Sambar *Rusa unicolor*, Cheetal *Axis axis*, Tufted Grey Langur *Semnopithecus priam*, Bonnet Macaque *Macaca radiata*, Grey Slender Loris *Loris lydekkerianus*, Wild Dog *Cuon alpinus*, Wild Boar *Sus scrofa*, Indian Porcupine *Hystrix indica*, and Black-naped Hare *Lepus nigricollis*.

VULNERABLE	
Yellow-throated Bulbul	*Pycnonotus xantholaemus*
Nilgiri Pipit	*Anthus nilghiriensis*
NEAR THREATENED	
Kerala Laughingthrush	*Strophocincla fairbanki*
Grey-headed Bulbul	*Microtarsus priocephalus*
Black-and-Orange Flycatcher	*Ficedula nigrorufa*
ENDEMIC BIRD AREA 123: WESTERN GHATS	
Malabar Parakeet	*Psittacula columboides*
Flame-throated Bulbul	*Pycnonotus gularis*
Grey-headed Bulbul	*Microtarsus priocephalus*
Kerala Laughingthrush	*Strophocincla fairbanki*
Indian Rufous Babbler	*Turdoides subrufa*
Black-and-Orange Flycatcher	*Ficedula nigrorufa*
White-bellied Blue Flycatcher	*Cyornis pallipes*
Nilgiri Flowerpecker	*Dicaeum concolor*
Small Sunbird	*Leptocoma minima*
BIOME 11: INDO-MALAYAN TROPICAL DRY ZONE	
Jungle Bush-quail	*Perdicula asiatica*
Rock Bush-quail	*Perdicula argoondah*
Indian Peafowl	*Pavo cristatus*
Plum-headed Parakeet	*Psittacula cyanocephala*
Brown-headed Barbet	*Megalaima zeylanica*
Yellow-crowned Woodpecker	*Dendrocopos mahrattensis*
Black-rumped Flameback	*Dinopium benghalense*
Common Woodshrike	*Tephrodornis pondicerianus*
White-browed Bulbul	*Pycnonotus luteolus*
Indian Robin	*Saxicoloides fulicatus*
Rufous-bellied Babbler	*Dumetia hyperythra*
Jungle Babbler	*Turdoides striatus*
Yellow-billed Babbler	*Turdoides affinis*
Grey-headed Starling	*Sturnus malabaricus*
White-bellied Drongo	*Dicrurus caerulescens*
Ashy Woodswallow	*Artamus fuscus*
BIOME 10: INDIAN PENINSULA TROPICAL MOIST FOREST	
Blue-faced Malkoha	*Phaenicophaeus viridirostris*
White-cheeked Barbet	*Megalaima viridis*
Malabar Barbet	*Psilopogon malabaricus*
Indian Scimitar-babbler	*Pomatorhinus horsfieldii*

LAND USE

- Nature conservation and research

P.O. NAMEER

Chinnar WLS is located in the rain shadow region of the Western Ghats and it has Tropical Thorn Forest and Dry Mixed Deciduous Forest Yellow-throated Bulbul *Pycnonotus xantholaemus* is found here

THREATS AND CONSERVATION ISSUES

- Grazing
- Firewood collection
- Fragmentation due to power lines and roads

The tribal Mudhuvas and Hill Pulayas had traditionally settled in the sanctuary in 10 different places. In the past, they used to depend for food on the forest alone, now they cultivate *ragi* and lemon grass. However, they still depend on the forest for some food plants, firewood, and to graze their cattle. The tribals also collect minor forest produce such as honey. The inhabitants of the neighbouring village of Marayoor also collect firewood from this area. Educationally and socio-economically, the tribals are very backward. They should be provided with smokeless stoves (*chullah*s), or ideally LPG gas stoves and LPG at subsidized rates to reduce their consumption of firewood.

Fire management is a controversial issue in Chinnar. This site has scrub jungle vegetation which is maintained by occasional natural fires. However, since it was declared a sanctuary, the Forest Department has prevented all types of fires, resulting in the alteration of vegetation, definitely to an upper level of succession, but detrimental to many of the fauna associated with thorny scrub jungle vegetation (P.O. Nameer, *in litt*. 2003).

KEY CONTRIBUTOR

P.O. Nameer

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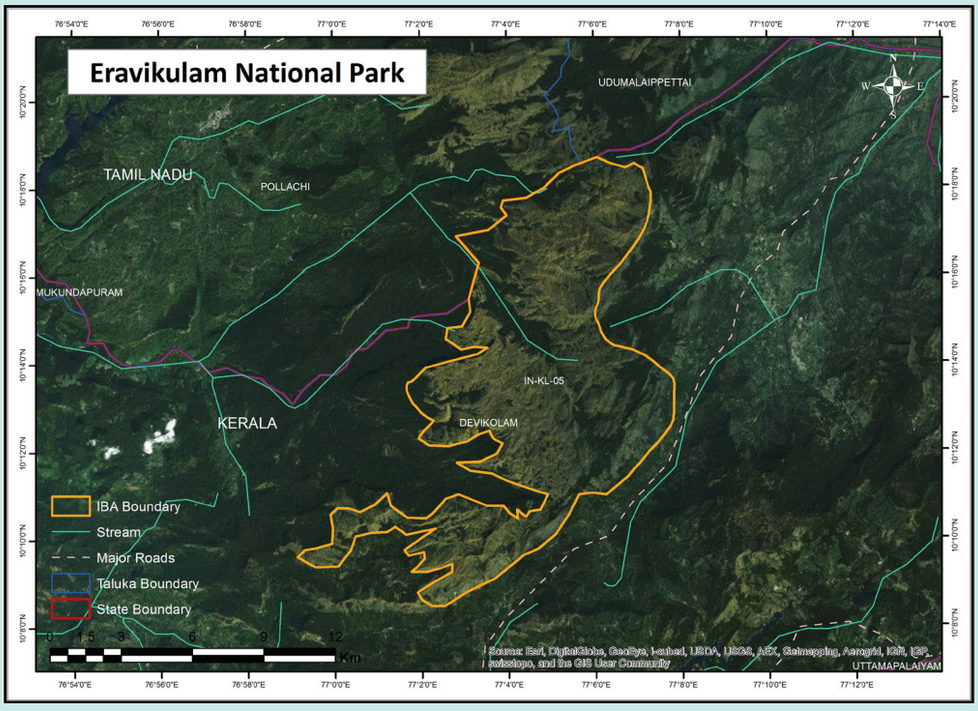
ERAVIKULAM NATIONAL PARK

IBA Site	: IN-KL-05	**Altitude**	: 1,400–2,695 msl
State	: Kerala	**Rainfall**	: 4,500 mm
District	: Idukki	**Temperature**	: 3 ºC to 20 ºC
Coordinates	: 10º 05' –10º 20' N, 77° 0' – 77º 10' E	**Biogeographic Zone**	: Western Ghats
Ownership	: State	**Habitats**	: Subtropical Broadleaf Hill Forest, Montane Grassy Slopes
Area	: 9,700 ha		

IBA CRITERIA: A1 (Threatened species), A2 (Endemic Bird Area 123: Western Ghats), A3 (Biome 10: Indian Peninsula Tropical Moist Forest)

PROTECTION STATUS: National Park, established in February 1978.



GENERAL DESCRIPTION

Eravikulam National Park lies along the crest of the Western Ghats in the high ranges of Idukki district of Kerala. The nearest town, Munnar, is accessible by road from Cochin and Kottayam. Till 1975, the High Range Game Preservation Association, Munnar managed this area, when it was declared a sanctuary. In 1978, it became a national park, mainly to protect the endemic Nilgiri Tahr *Nilgiritragus hylocrius*.

Eravikulam is the finest example of what remains of the shola-grassland ecosystem in the Western Ghats. It is also the best remaining habitat of some highly endangered and endemic mammals such as the Nilgiri Tahr and the Nilgiri Marten *Martes gwatkinsii*.

Anaimudi, at an elevation of 2,695 m, is the highest peak in the Western Ghats. At the base of Anaimudi is the Eravikulam plateau, with an average elevation of 2,000 m. Eravikulam plateau is part of a larger plateau called the High Ranges. The climate of Eravikulam and areas of similar altitude in the Western Ghats is subtropical. The wind-swept hills and rolling plateaus have grassland vegetation, and the valleys and folds harbour biologically rich forests called sholas. Thus the natural vegetation of the plateau is a mosaic of sholas and grasslands. Eravikulam is perhaps the largest contiguous, undisturbed shola-grassland ecosystem remaining in the Western Ghats. It is definitely the only place where one can now witness the grandeur of the mountains when, once in 12 years, whole tracts are covered by the mass flowering Neelakurinji *Strobilanthes kunthianus*, "the great blue flower of Nilgiri".

About 60% of Eravikulam National Park is under grassland. Menon (1997) identified three grassland

communities based on characteristic spectral radiance value: i. *Dichanthium polyptychum-Eulalia pheothrix-Chrysopogon zeylanicus;* ii. *Arundinella mesophylla-Andropogon lividus-Ischaemum indicum-Chrysopogon zeylanicus*; and iii. *Arundinella purpurea-Chrysopogon zeylanicus-Eulalia pheothrix*.

About 25% of the national park constitutes shola forest, consisting of *Maesa indica*, *Microtropis ramiflora*, *Syzygium arnottianum*, *Ixora notoniana*, *Ternstroemia japonica*, *Cinnamomum wightii*, and *Mahonia leschnaultii* (Menon 1997). A small percentage of West Coast Tropical Evergreen forest is also seen. About 6% constitute rocks and cliffs, an important habitat of the Nilgiri Tahr.

AVIFAUNA

The Kerala Forest Research Institute recorded a total of 146 species of birds within the site during a survey in 1997. In a four-day survey in March, 1997, Uthaman (1998) recorded 92 species. In a paper, Praveen & Nameer (2015) recorded 120 species from six base camps. Compared to some bird-rich areas of Kerala, this is a low figure. However, given the fact that 60% of the Eravikulam landscape is covered by grasslands, this is a plausible figure. The extreme climatic conditions of the high altitude plateau are a deterrent for many generalist birds; however, endemism is very high. Eravikulam is an important habitat of many montane birds such as the Palni Laughingthrush *Strophocincla fairbanki*, Nilgiri Flycatcher *Eumyias albicaudatus*, Black-and-Orange Flycatcher *Ficedula nigrorufa*, Nilgiri Wood-pigeon *Columba elphinstonii*, White-bellied Blue Robin *Myiomela albiventris*, Indian Broad-tailed Grass-warbler *Schoenicola platyurus*, and Nilgiri Pipit *Anthus nilghiriensis* that are endemic to the Western Ghats. During a 2012 bird survey, Shashank Dalvi photographed the Vulnerable Kashmir Flycatcher *Ficedula subrubra* on the outskirts of the park (Dalvi 2013). There are several reports of the endemic and secretive Nilgiri Thrush *Zoothera neilgherriensis* from Eravikulam NP; however, its real density in the sholas is much higher than is actually reported, as evidenced during recent mist-netting exercises (C.K. Vishnudas, *pers. comm*. 2014).

Along with Grasshills and Mukurthi NP (both IBAs), Eravikulam could be a very important site for altitudinal and habitat specialists such as the Black-and-Orange Flycatcher. Uthaman (1998) and his team came across this species 13 times in four days.

The grasslands of Eravikulam are an excellent wintering ground for migrant raptors such as the Near Threatened Pallid Harrier *Circus macrourus* and Common (Steppe) Buzzard *Buteo [buteo] vulpinus*. The grasslands appear to be the last stronghold of Nilgiri Pipit (Praveen & Nameer 2013), which is now proposed for uplisting to Endangered (Robin *et al*. 2014).

Eravikulam lies in the Western Ghats Endemic Bird Area (Stattersfield *et al*. 1998) in which 16 endemic or restricted-range species were listed, and according to the latest taxonomy there are 26. In this site, 10 of these 26 endemics have been found. For some endemic birds, such as the Nilgiri Pipit, this is one of the most important sites in its overall distributional range (Robin *et al*. 2014).

BirdLife International (undated) has classified species that are typical of different biomes. Eravikulam, like other IBAs of the Western Ghats, falls in Biome 10 (Indian Peninsula Tropical Moist Forest). Fifteen bird species are representative of this biome. At Eravikulam, seven of these species have been seen till now.

Eravikulam NP is also an important site for winter migrants from the Himalaya and beyond. For example, Tickell's Leaf-warbler *Phylloscopus affinis* and Tytler's Leaf-warbler *Phylloscopus tytleri*, birds of the temperate forests of the Himalaya, winter here in large numbers. Similarly, Blue-headed Rock-thrush *Monticola cinclorhynchus* and Pied Thrush *Zoothera wardii* are found here in winter. Both species belong to the subtropical forests of the Himalaya.

ENDANGERED	
White-bellied Blue Robin	*Myiomela albiventris*
VULNERABLE	
Nilgiri Wood-pigeon	*Columba elphinstonii*
Kashmir Flycatcher	*Ficedula subrubra*
Indian Broad-tailed Grass-warbler	*Schoenicola platyurus*
Nilgiri Pipit	*Anthus nilghiriensis*
NEAR THREATENED	
Pallid Harrier	*Circus macrourus*
Grey-headed Bulbul	*Microtarsus priocephalus*
Kerala Laughingthrush	*Strophocincla fairbanki*
Black-and-Orange Flycatcher	*Ficedula nigrorufa*
Nilgiri Flycatcher	*Eumyias albicaudatus*
Tytler's Leaf-warbler	*Phylloscopus tytleri*
ENDEMIC BIRD AREA 123: WESTERN GHATS	
Nilgiri Wood-pigeon	*Columba elphinstonii*
Nilgiri Pipit	*Anthus nilghiriensis*
White-bellied Blue Robin	*Myiomela albiventris*
Kerala Laughingthrush	*Strophocincla fairbanki*
Black-and-Orange Flycatcher	*Ficedula nigrorufa*
Nilgiri Flycatcher	*Eumyias albicaudatus*
White-bellied Blue Flycatcher	*Cyornis pallipes*
Small Sunbird	*Leptocoma minima*
Nilgiri Thrush	*Zoothera neilgherriensis*
BIOME 10: INDIAN PENINSULA TROPICAL MOIST FOREST	
Indian Swiftlet	*Aerodramus unicolor*
Malabar Trogon	*Harpactes fasciatus*
White-cheeked Barbet	*Megalaima viridis*
Yellow-browed Bulbul	*Acritillas indica*
Malabar Whistling-thrush	*Myophonus horsfieldii*
Indian Scimitar-babbler	*Pomatorhinus horsfieldii*
Dark-fronted Babbler	*Rhopocichla atriceps*

Some very rare birds of the Western Ghats, including Eurasian Woodcock *Scolopax rusticola*, Lesser Kestrel *Falco naumanni*, Eastern Grass-owl *Tyto longimembris*, and Eurasian Crag-martin *Ptyonoprogne rupestris* (Sashikumar *et al.* 2011) have also been reported from the park.

OTHER KEY FAUNA

The Nilgiri Tahr is the star attraction of this site. An estimated 700–800 Nilgiri Tahr inhabit Eravikulam National Park, making it the largest wild population in the world. The Nilgiri Tahr generally inhabits the fringes of the grassy plateau and moves on to the steep rock-faces and cliffs bordering it. Other ungulates are Sambar *Rusa unicolor*, Barking Deer *Muntiacus muntjak*, and Gaur *Bos gaurus*. Tiger *Panthera tigris*, Leopard *Panthera pardus*, and Wild Dog *Cuon alpinus* are the major carnivores (ZSI, 2002).

Eravikulam NP has a migratory population of Asiatic Elephant *Elephas maximus*. Smaller carnivores include Small Indian Civet *Viverricula indica* and Jungle Cat *Felis chaus*. Sloth Bear *Melursus ursinus*, Nilgiri Langur *Semnopithecus johni*, and Wild Boar *Sus scrofa* are seen in the sholas and adjoining tea estates. The rare Nilgiri Marten *Martes gwatkinsii* has also been reported from the park.

Eravikulam NP has been poorly explored for its fish fauna, with only four species recorded, of which Rainbow Trout *Oncorhynchus mykiss* is an introduced species (Rajeev Raghavan, *pers. comm.* 2014).

Eravikulam and the surrounding hills are type localities for many species of frogs such as *Raorchestes resplendens*, *R. griet*, *R. munnarensis*, *R. chlorosoma*, *Micrixalus adonis*, *M. frigidus*, *M. phyllophilus*, and *Nyctibatrachus poocha*. Biju *et al.* (2014) conducted a survey in 2002 at Eravikulam National Park and discovered a new species of Dancing Frog. This species was named Cold Stream Dancing Frog *Micrixalus frigidus*. It is found in high altitude cold streams above 1,800 msl.

LAND USE

- Nature education and conservation
- Research

THREATS AND CONSERVATION ISSUES

- Firewood collection
- Grazing
- Invasive species from adjacent plantations

The major part of the land around the national park is covered with tea plantations. Private holdings are very few, and such holdings are being planted with coffee, pepper, and coconut. There are no villages within the national park. The only tribal settlement is at Lakkam near Chattamunnar. There are three towns in close proximity, Devicolam, Munnar, and Marayoor. The adjacent lands are being used to cultivate tea, coffee, pepper, and other agricultural crops.

DHRITIMAN MUKHERJEE

Between 700–800 Nilgiri Tahr inhabit Eravikulam National Park, the largest wild population in the world of this Western Ghats endemic

DHRITIMAN MUKHERJEE

The famous Eravikulam National Park has Anaimudi, the highest peak (2,695 msl) in the Western Ghats. This mountain has subtropical broadleaf hill forest and, montane grassy slopes

Traditionally, the hill tribes (Muthuvas) stay within the national park and are dependent on it for their livelihood. They engage in cultivating lemon grass, and collecting minor forest produce from the adjoining forest areas.

There is extensive pesticide use in the adjoining tea plantations. No study has been conducted to assess the adverse impacts of pesticides on the montane biodiversity of the park. However, they are likely to have some adverse effects at least on the edges.

The proposed Munnar High Dam project, if implemented, will adversely affect about 50% of the population of the Nilgiri Tahr, as the tunnels of the project would pass through Rajamalai areas. The Anamalayar Dam on the Bhimamalai river of the proposed Pooyamkutty Project also poses a direct threat to this IBA. New settlements near Anakulam and Mankulam in the west are further a threats to the IBA.

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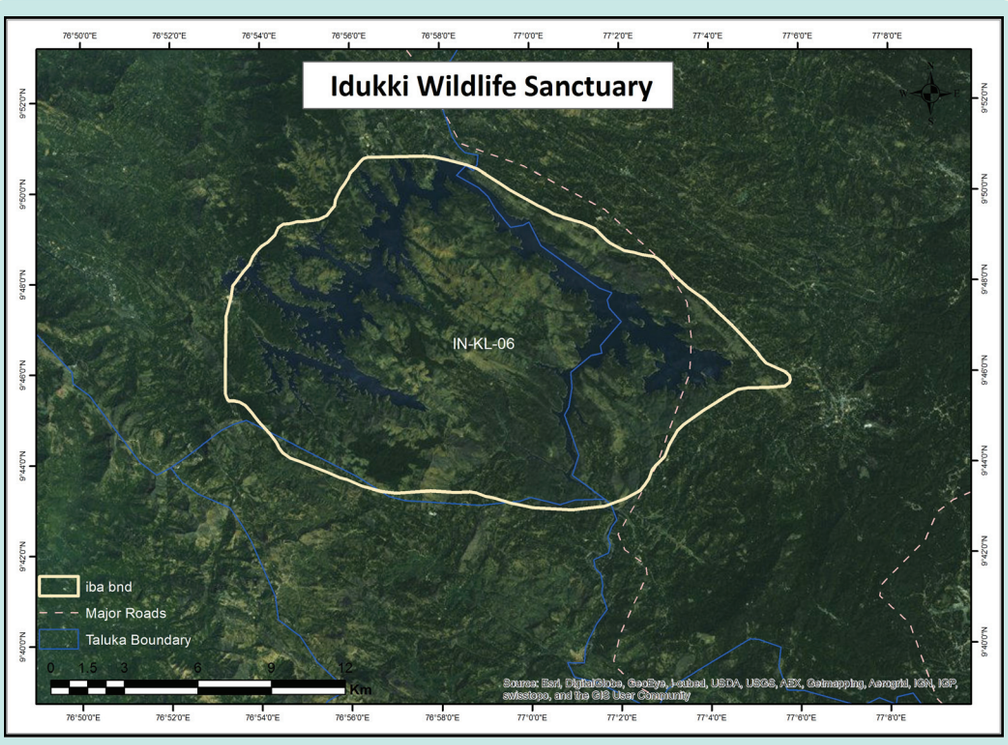
IDUKKI WILDLIFE SANCTUARY

IBA Site	: IN-KL-06	**Rainfall**	: 2,900 mm to 4,400 mm
Administrative Region (State)	: Kerala	**Temperature**	: 27 ºC to 37 ºC
District	: Idukki	**Biogeographic Zone**	: Western Ghats
Coordinates	: 9º 40' to 9º 55' N, 76° 50' to 77° 05' E	**Habitats**	: Tropical Semi-evergreen Forests, Tropical Secondary Scrub Moist Deciduous Forest with Savanna Savanna Grasslands, Monoculture
Ownership	: State		
Area	: 105.36 sq. km		
Altitude	: 800–1,272 msl		

IBA CRITERIA: A1 (Threatened species), A2 (Endemic Bird Area 123: Western Ghats), A3 (Biome 10: Indian Peninsula Tropical Moist Forest)

PROTECTION STATUS: Wildlife Sanctuary, established February, 1976.



GENERAL DESCRIPTION

The Idukki Wildlife Sanctuary, with an extent of 105.36 sq. km, is situated in the Western Ghats in Udumpanchola and Thodupuzha *taluk*s of Idukki district. The area is part of Nagarampara Reserve Forest, forms the catchment area of Periyar river, and caters to the Idukki Hydroelectric Project (Ramesan 1990–2000). The area was previously part of Kottayam Forest Division and now comes under the administrative control of the Wildlife Warden, Idukki. It is situated adjacent to and south of Painavu, the district headquarters of Idukki revenue district and is 120 km north-east of Kottayam. In the 1960s, the Idukki Hydroelectric Project was started and involved the construction of three dams, namely Idukki, Cheruthony, and Kulamavu. The Idukki reservoir is spread over 33 sq. km. In order to prevent siltation, the Government of Kerala protected the surrounding forest and established a sanctuary. The sanctuary includes the Idukki reservoir, and is part of Anamudi Elephant Reserve.

Idukki Lake, which borders three sides of the sanctuary, offers a panoramic view. The sanctuary consists of two sections (1) Idukki which was originally part of Nagarampara Range and (2) Kizhukanam Section, originally part of Ayyappancoil Range. The average elevation of the sanctuary is 900 m. The highest peak in the sanctuary is Kizhukalachimala (1,272 m).

The vegetation mainly consists of Moist Deciduous Forest, some Tropical Wet Evergreen Forests, Semi-evergreen

forests, and Savannah grasslands on certain hilltops. Unfortunately, the Kerala Forest Development Corporation has converted most of the grasslands into Eucalyptus plantations.

AVIFAUNA

The avifauna of the sanctuary was studied in 2000 (Nameer 2000). Later, another bird diversity survey was done in 2003 (Nameer 2003). Easa *et al.* (2009) studied the birds of the sanctuary in 2009. Nameer (2000, 2003) recorded 169 species of birds from Idukki WLS, while Easa *et al.* (2009) reported 172 species. Sashikumar *et al.* (2011) have published a checklist of 214 birds of Idukki WLS.

During the latest bird survey of Idukki Wildlife Sanctuary (Praveen *et al.* 2013), 16 of the Western Ghats (Endemic Bird Area 123) endemics were recorded from this sanctuary. Three Vulnerable (VU) and four Near Threatened (NT) species were also recorded. In this survey, 182 species of birds were recorded from the sanctuary, which included 21 species of birds of prey, 13 species of ground birds, 11 species of primary hole-nesting birds, and four species of parasitic cuckoos.

OTHER KEY FAUNA

A small population of less than 100 Asiatic Elephant *Elephas maximus* is found in this IBA. They can be seen on the banks of the reservoir along the northwestern borders (Vijaykumaran & Balasubramanyan 1985). Wason (1984) mentioned in the records of Zoological Survey of India the existence of 42 species of mammals from Idukki before the construction of the dam. A survey conducted in March 2009 (Varghese, 2012), indicated the presence of only 28, namely Asiatic Elephant *Elephas maximus*, Sloth Bear *Melurus ursinus*, Sambar Deer *Rusa unicolor*, Barking Deer *Muntiacus muntjak*, Mouse Deer *Moschiola indica*, Wild Boar *Sus scrofa*, Indian Crested Porcupine *Hystrix indica*, Bonnet Macaque *Macaca radiata*, Black-naped Hare *Lepus nigricollis*, Common Mongoose *Herpestes edwardsii*, Wild Dog *Cuon alpinus*, and Malabar Giant Squirrel *Ratufa indica*. Several herds of feral cattle including buffaloes are seen in the sanctuary, whose population is said to be on the rise. There are no confirmed records, direct or indirect, of Tiger *Panthera tigris* and Leopard *P. pardus* from Idukki. Gaur *Bos gaurus* is believed to be extirpated from Idukki WLS, probably due to its isolation from the adjoining forest areas. The survey conducted by Varghese (2012) reported 28 species of mammals, 55 species of reptiles, 28 species of amphibians, and 30 species of fishes from Idukki WLS. Seventy-six species of butterflies belonging to five families were also recorded from Idukki WLS (Varghese 2012). Among the reptiles, the presence of the rare Travancore Tortoise *Indotestudo travancorica* is noteworthy. The amphibians recorded include *Hylarana temporalis*, *Zakerana keralensis*, *Duttaphrynus melanostictus*, *Hoplobatrachus tigerinus*, *Euphlyctis cyanophlyctis*, *Ramanella anamalaiensis*, *Ramanella variegata*, *Kaloula taprobanica*, and *Nasikabatrachus sahyadrensis*.

VULNERABLE	
Greater Spotted Eagle	*Clanga clanga*
Nilgiri Wood-pigeon	*Columba elephinstonii*
India Broad-tailed Grass-warbler	*Schoenicola platyurus*
NEAR THREATENED	
Pallid Harrier	*Circus macrourus*
River Tern	*Sterna aurantia*
Great Pied Hornbill	*Buceros bicornis*
Nilgiri Flycatcher	*Eumyias albicaudatus*
ENDEMIC BIRD AREA 123: WESTERN GHATS	
Nilgiri Wood-pigeon	*Columba elephinstonii*
Grey-fronted Green-pigeon	*Treron affinis*
Malabar Parakeet	*Psittacula columboides*
Malabar Grey Hornbill	*Ocyceros griseus*
Flame-throated Bulbul	*Pycnonotus gularis*
Nilgiri Flowerpecker	*Dicaeum concolor*
Malabar Barbet	*Psilopogon malabaricus*
Indian Rufous Babbler	*Turdoides subrufa*
Malabar Starling	*Sturnia blythii*
Malabar Woodshrike	*Tephrodornis sylvicola*
White-bellied Blue Flycatcher	*Cyornis pallipes*
Wynaad Laughingthrush	*Dryonastes delesserti*
Nilgiri Flycatcher	*Eumyias albicaudatus*
Indian Broad-tailed Grass-warbler	*Schoenicola platyurus*
Small Sunbird	*Leptocoma minima*
White-bellied Treepie	*Dendrocitta leucogastra*

A survey conducted by the Department of Forests and Wildlife (Unni Pulikkal *et al.* 2012) found rare species of butterflies in Idukki Wildlife Sanctuary, such as Baby Five-Ring *Ypthima tabella*, Bright Babul Blue *Azanus ubaldus*, Cornelian *Deudorix epijarbas*, Southern Blue Oakleaf *Kallima horsfieldi*, and Coorg Forest Hopper *Arnetta mercara*. This survey recorded 148 species of butterflies in the sanctuary. Another survey by Zoological Survey of India and Cochin Natural History Society (CNHS) on invertebrates recorded Malabar Flash *Rapala lankana* and Golden Tree-Flitter *Quedara basiflava* from this IBA.

LAND USE

- Nature conservation and research
- Forestry

THREATS AND CONSERVATION ISSUES

- Grazing
- Monoculture plantations
- Firewood collection
- Forest fires
- Feral cattle

The southern side of the sanctuary is covered with tea estates. Labourers mainly depend upon Vagavanom and Vanmavu area for collection of firewood for their livelihood. Their cattle enter the sanctuary to graze. However, the damage is temporary and can be controlled easily. Permanent damage to the ecology of this forest was done during 1968–1969 when three dams (Idukki, Cheruthony, and Kulamavu) were constructed. Not only was a vast tropical forest submerged, but a much larger area was affected due to the displacement and resettlement of hill-tribals. Moreover, during the construction of the dams, poaching of wild animals and felling of trees became rampant. Only in recent years has there been some control on poaching. Many dam workers settled in the area, further encroaching on the forest land. This is now a political issue; no one dares to evict these illegal settlers.

There are 12 hill-men settlements inside the sanctuary and these people depend on the sanctuary for their livelihood (firewood, grazing, and non-timber forest products). Due to repeated burning of the grassland, mostly by settlers and tribals, unpalatable fire-resistant species such as *Themeda* sp. and *Cymbopogon* sp. now dominate the land (Vijaykumaran & Balasubramanyan 1985). The forest fires which destroy the savannah grasslands must be controlled by sensitizing the local populace and also by deploying more firewatchers at strategic points, especially during the summer.

The sanctuary has been under threat of encroachment, as there are a large number of settlements in and around it. People residing in these areas often enter the sanctuary to collect firewood. Idukki district is an industrially backward area and hence the unemployment problem is acute. All these factors contribute to incidents of encroachment and illicit tree felling (Ramesan 1990–2000). The sanctuary is a fragmented part of the High Range forests, separated from the forest tracts extending between Munnar Hills and Periyar Tiger Reserve by the construction of Idukki Dam.

In Idukki WLS, the landscape is dominated by the savannas, which must be protected from further biotic interference, permitting succession to set in. Thereby these biotically modified habitats could be brought back to bear climax vegetation. This would be beneficial to the endemic and threatened birds. As grazing is a major conservation problem in Idukki, feral cattle in the Idukki WLS should be eliminated in a phased manner.

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IBA Team, Vishnupriyan Kartha K.

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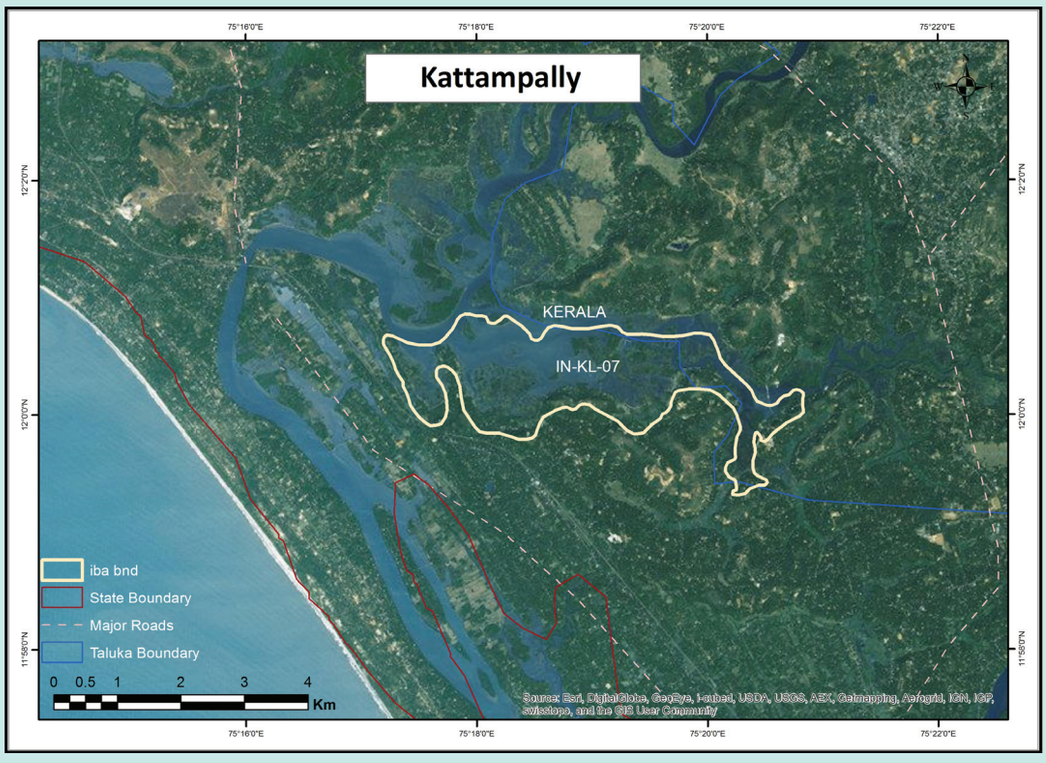
KATTAMPALLY

IN-KL-07

IBA Site	: IN-KL-07	**Altitude**	: 0–5 msl
Administrative Region (State)	: Kerala	**Rainfall**	: 3,000–4,400 mm
District	: Kannur	**Temperature**	: 20 ºC to 38 ºC
Coordinates	: 11º 55' 00" N, 75° 19' 60" E	**Biogeographic Zone**	: Coast
Ownership	: Private, State	**Habitats**	: Freshwater/Brackish Swamp, Tidal Marsh, Sub-tropical Secondary Scrub, Mangroves
Area	: 750 ha		

IBA CRITERIA: A1 (Threatened species), A4i (≥1% of biogeographic population), A4iii (≥20,000 waterbirds)

PROTECTION STATUS: Not officially protected.



GENERAL DESCRIPTION

Once a large swamp on the floodplains of the Valapattanam river with reedbeds and mangrove vegetation, Kattampally was partly converted to paddyfields and coconut plantations. The ambitious Kattampally agricultural development project, consisting mainly of a regulator-cum-road bridge and bunds along the sides of the water channel, was commissioned in 1966, and was expected to prevent salt-water intrusion and "convert 450 ha of swamp into paddy fields". This has played havoc with the natural water regime and the traditional agricultural system that used rice varieties which thrived in saline water and had been sustainable for centuries. Less than 10% of the former paddyfields are in use now. There is no tidal effect and the mangroves are all gone, only the reedbeds and aquatic vegetation like water lilies are present. There are considerable stretches of open water also.

Due to continued demand from the farmers who believe that the pre-dam situation has to be reinstated so that traditional rice cultivation is possible, the shutters of the dam are being kept open seasonally since April, 2009 and now the tides bring in saline water. The whole wetland ecosystem is undergoing change; the water level has been altered, and several species of mangrove are coming up throughout the wetland. *Hydrilla verticillata* forms the major part of the floating vegetation. Species common in the

VULNERABLE	
Asian Woollyneck	*Ciconia episcopus*
Indian Spotted Eagle	*Clanga hastata*
Greater Spotted Eagle	*Clanga clanga*
Eastern Imperial-eagle	*Aquila heliaca*
Bristled Grassbird	*Chaetornis striatus*
NEAR THREATENED	
Ferruginous Duck	*Aythya nyroca*
Painted Stork	*Mycteria leucocephala*
Black-headed Ibis	*Threskiornis melanocephalus*
Oriental Darter	*Anhinga melanogaster*
Black-tailed Godwit	*Limosa limosa*
River Tern	*Sterna aurantia*

marshy area are *Acanthus ilicifolius*, *Acrostichum aureum*, *Aeschynomene aspera*, *Avicennia marina*, *Blyxa octandra*, *Bruguiera cylindrica*, *Ceratopteris thalictroides*, *Cerbera odollam*, *Clerodendrum inerme*, *Crinum viviparum*, *Derris trifoliata*, *Eleocharis dulcis*, *E. geniculata*, *Fimbristylis ferruginea*, *Fuirena umbellata*, *Kandelia candel*, *Nymphaea nouchali*, *Nymphoides hydrophylla*, *N. indica*, *Pandanus odorifer*, *Premna serratifolia*, *Schoenoplectiella lateriflora*, *Schoenoplectus litoralis*, *Spinifex littoreus*, and *Wedelia trilobata* (Jayarajan 2008). The change in vegetation has to be closely monitored in the years to come. The overall effect of these changes on the avifauna is hard to predict.

AVIFAUNA

In all, 212 species of birds have been reported (Sashikumar and Rajeevan, 2014). This IBA site is famous for thousands of Northern Pintail *Anas acuta* and Garganey *Querquedula querquedula* that congregate here during winter. Since 1999, Greater Spotted Eagle *Clanga clanga*, a globally Threatened species, has been observed to winter here regularly. From 2001 onwards, Indian Spotted Eagle *Clanga hastata* is also found wintering here regularly; there were three sightings of Eastern Imperial-eagle *Aquila heliaca* and Bristled Grassbird *Chaetornis striatus* also. Oriental Pratincole *Glareola maldivarum* has established a breeding colony here, the first one known in Kerala.

This wetland serves as a feeding ground for several heronries. It is a regular counting site for the Asian Waterfowl Census organized by Asian Wetland Bureau (now Wetlands International) since 1986. During the census in 2008, 10,165 Garganey *Querquedula querquedula* (1% of biogeographic population: 3,500) and 2,000 Brown-headed Gull *Chroicocephalus brunnicephalus* (1% of biogeographic population: 1,500) were recorded. This IBA also qualifies for the A4i and A4iii criteria (Nameer *et al*. 2015).

The presence of 11 globally Threatened species qualifies this wetland for IBA status.

OTHER KEY FAUNA

Kattampally being a wetland, the number of terrestrial mammals here is rather limited, except for a stray Golden Jackal *Canis aureus* and Common Mongoose *Herpestes edwardsi*. Indian Smooth-coated Otter *Lutrogale perspicillata* is also reported from the wetland.

LAND USE

- Agriculture
- Aquaculture/fisheries

THREATS AND CONSERVATION ISSUES

- Poaching
- Mining
- Construction of roads and transport lines
- Excessive fishing
- Eutrophication

At present, the Kattampally wetland is totally unprotected. In the last five years, three bridges across the river and the approach roads leading to these have been constructed, cutting across the wetland. Apart from the disturbances caused by construction activities, the new roads have caused fragmentation of the wetland. As most of the wetland is privately owned, conservation is impossible without the cooperation of the local people. In the Budget Proposal of the Finance Minister, Kerala in the Legislative Assembly in March, 2012, it was announced that Munderi Kadav, a small part of the wetland within the Munderi Grama Panchayath, one of the nine *panchayaths* (village councils) in which the wetland is situated, will be declared as a bird sanctuary. No follow up action was taken to implement this proposal. Declaring only a small portion of the wetland as a bird sanctuary, and its lopsided 'development' with tourism as the first priority, will only enhance the existing disturbances and will drive away the few birds that remain here.

KEY CONTRIBUTOR

C. Sashikumar

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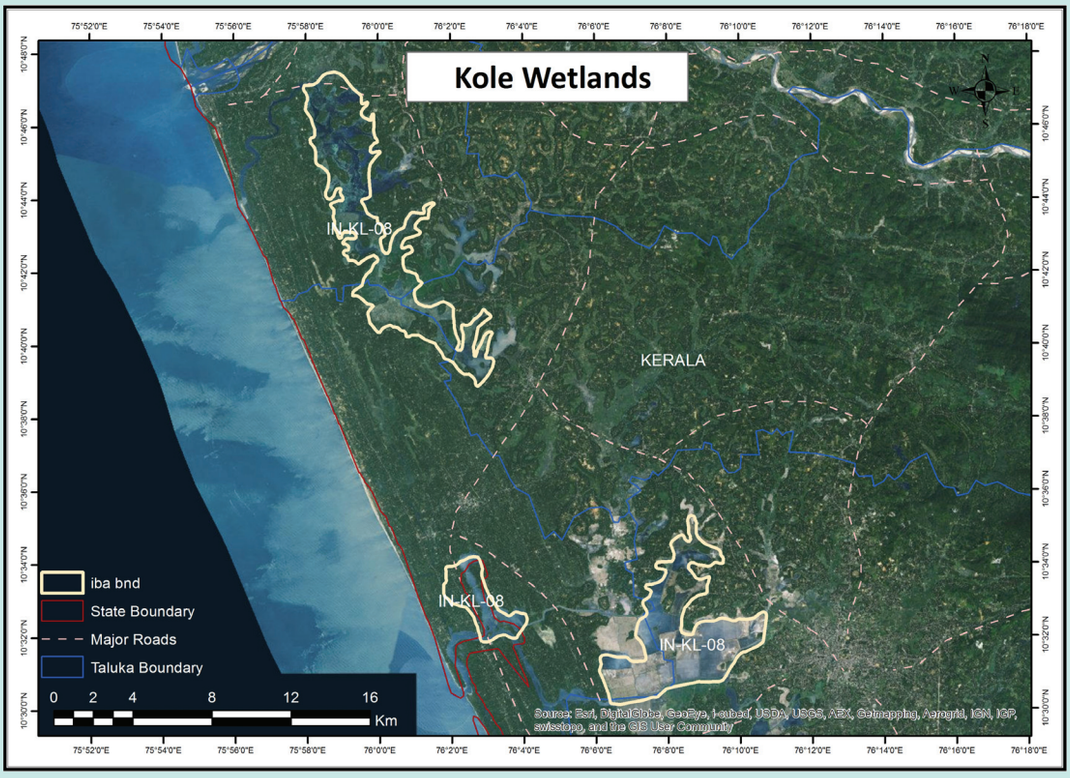
KOLE WETLANDS

IN-KL-08

IBA Site	:	IN-KL-08	**Area**	:	13,632 ha
Administrative Region (State)	:	Kerala	**Altitude**	:	0–1 msl
District	:	Thrissur, Malappuram	**Rainfall**	:	2,760 mm
Coordinates	:	10° 11' 29" N, 76° 10' 50" E	**Temperature**	:	21 °C to 38 °C
			Biogeographic Zone	:	Coast
Ownership	:	Private	**Habitats**	:	Freshwater Swamp

IBA CRITERIA: A1 (Threatened species), A4i (≥1% of biogeographic population), A4iii (≥20,000 waterbirds)

PROTECTION STATUS: Ramsar site.



GENERAL DESCRIPTION

Kole Wetlands have been a Ramsar Site since 2002 (Islam & Rahmani 2008), an Important Bird Area since 2004 (Islam & Rahmani 2004), and a High Value Biodiversity Area since 2009. Kole Wetlands cover an area of 13,632 ha, spread over Thrissur and Malappuram districts from the northern bank of Chalakudy river at their southern limit to the southern bank of Bharathapuzha river to the north (Johnkutty & Venugopal 1993). The name Kole refers to the peculiar cultivation practice carried out from December to May. *Kole*, a Malayalam word, indicates a field that gives a bumper crop, so long as floods do not damage it (Nameer 1992). Rice cultivation in Kole started as early as the 18th century by reclaiming the Trichur *kayal* lands (backwaters) by erecting temporary earthen bunds. The water pumped out from the field is stored in a network of canals. The Kole areas are low-lying and have a long central, narrow strip, with many pockets running into cultivated land on either side. The region is naturally subjected to salt water ingression. During the monsoon, the entire region, which gets submerged, is cultivated by draining the water and by erecting bunds. Regulators are provided at strategic points to prevent the intrusion of salt water into the Kole wetlands during the cultivation period. In recent years, aquaculture during non-agricultural months is being promoted by government.

The main activity in and around Kole is paddy cultivation. Grasses and sedges are found on the bunds surrounding and

interspersed among the paddy fields. As Kole is a large sprawling wetland, with human habitation all around, there are coconut and arecanut plantations, and gardens with cultivated plants.

AVIFAUNA

Kole Wetlands support 243 species, of which 130 (53.50%) are resident birds, 89 (36.63%) long distance migratory birds, and 24 (9.87%) vagrants (Nameer *et al*. in press). Kole Wetlands support >1% threshold of the biogeographic population of 17 species of waterbirds, namely Oriental Darter *Anhinga melanogaster*, Little Cormorant *Microcarbo niger*, Indian Cormorant *P. fuscicollis*, Little Egret *Egretta garzetta*, Median Egret *E. intermedia*, Large Egret *Casmerodius albus*, Asian Openbill *Anastomus oscitans*, Black-headed Ibis *Threskiornis melanocephalus*, Glossy Ibis *Plegadis falcinellus*, Cotton Pygmy-goose *Nettapus coromandelianus*, Garganey *Querquedula querquedula*, Small Pratincole *Glareola lactea*, Kentish Plover *Charadrius alexandrinus*, Wood Sandpiper *Tringa glareola*, Pacific Golden Plover *Pluvialus fulva*, Temminck's Stint *Calidris temminckii*, and Whiskered Tern *Chlidonias hybrida* (Nameer 1992, 1993a & b, Sivaperuman & Jayson 2000, Jayson 2002).

Kole Wetlands also support birds of high conservation value. Fifteen species of globally Threatened birds, of which two are Endangered, four are Vulnerable, and nine Near Threatened, are reported from Kole Wetlands. The Endangered Black-bellied Tern *Sterna acuticauda* and Egyptian Vulture *Neophron percnopterus*, the Vulnerable Indian Spotted Eagle *Clanga hastata,* Greater Spotted Eagle *Clanga clanga*, and Asian Woollyneck *Ciconia episcopus* are seen in Kole Wetlands. There is a stray record of Macqueen's Bustard *Chlamydotis macqueeni*. The Near Threatened birds seen are Painted Stork *Mycteria leucocephala*, Black-headed Ibis *Threskiornis melanocephalus*, Spot-billed Pelican *Pelecanus philippensis*, Oriental Darter *Anhinga melanogaster*, Cinereous Vulture *Aegypius monachus*, Pallid Harrier *Circus macrourus*, Black-tailed Godwit *Limosa limosa*, Eurasian Curlew *Numenius arquata,* and River Tern *Sterna aurantia*. The Egyptian Vulture, Cinereous Vulture, and Macqueen's Bustard are vagrants at Kole Wetlands, each of which were recorded from here only once, unlike the rest which occur regularly.

ENDANGERED	
Black-bellied Tern	*Sterna acuticauda*
Egyptian Vulture	*Neophron percnopterus*
VULNERABLE	
Indian Spotted Eagle	*Clanga hastata*
Greater Spotted Eagle	*Clanga clanga*
Asian Woollyneck	*Ciconia episcopus*
NEAR THREATENED	
Painted Stork	*Mycteria leucocephala*
Black-headed Ibis	*Threskiornis melanocephalus*
Spot-billed Pelican	*Pelecanus philippensis*
Oriental Darter	*Anhinga melanogaster*
Cinereous Vulture	*Aegypius monachus*
Pallid Harrier	*Circus macrourus*
Black-tailed Godwit	*Limosa limosa*
Eurasian Curlew	*Numenius arquata*
River Tern	*Sterna aurantia*

The birds of Kole Wetlands have been monitored systematically since 1992 through the Asian Waterbird Census (AWC). Apart from this annual exercise, numerous birdwatchers collect and share data through various media. The population of the waterbirds of Kole Wetlands has been fluctuating over the past 20 years. Since 1992, there have been three instances during 1997, 1998, and 2006, when the waterbird population fell below 20,000. During all the other years, the waterbird population was more than 20,000, with the maximum number (60,299) recorded in 2001 (Nameer *et al*. in press).

Kole Wetlands may have the largest roost of terns in India. Sashikumar (1991) estimated about 25,000, including 10,000 Whiskered Tern *Chlidonias hybrida*. According to Wetlands International (2012), 1% population threshold of Whiskered Tern in India is 1,000. Therefore, almost 10% of the population of this species congregates at Kole Wetlands. Other species at Kole Wetlands with >1% biogeographic population threshold are (% of the bird's biogeographic population at Kole Wetlands is given in brackets): Little Egret *Egretta garzetta* (5.2%), Oriental Darter *Anhinga melanogaster* (4.1%), Small Pratincole *Glareola lactea* (4.1%), Median Egret *Mesophoyx intermedia* (2.9%), Garganey *Querquedula querquedula* (2.9%), Pacific Golden-plover *Pluvialis fulva* (2.7%), Cotton Pygmy-goose Teal *Nettapus coromandelianus* (2.1%), Glossy Ibis *Plegadis falcinellus* (2%), Wood Sandpiper *Tringa glareola* (1.8%), Black-headed Ibis *Threskiornis melanocephalus* (1.6%), Kentish Plover *Charadrius alexandrinus* (1.5%), Asian Openbill *Anastomus oscitans* (1.4%), Little Cormorant *Microcarbo niger* (1.1%), Indian Cormorant *Phalacrocorax fuscicollis* (1.1%), Large Egret *Casmerodius albus* (1.1%), and Temminck's Stint *Calidris temminckii* (1%) (Nameer *et al.* in press).

A total of 53,055 birds were counted in 2014. This is the second highest count from Kole. Another time, the bird count at Kole wetlands crossed 50,000 in 2004, when 50,906 birds were recorded (P.O. Nameer *in litt.* 2014).

Kole Wetlands perfectly fits three criteria: A1 (15 globally Threatened and Near Threatened species), A4i (≥1% of the biogeographic population of 17 species of waterbirds), and A4iii (≥ 20,000 waterbirds).

OTHER KEY FAUNA

Nameer & Balachandran (2010) report 21 species of mammals, 14 species of reptiles, and six species of

amphibians. C.P. Shaji reported 36 species of fish from Kole Wetlands.

LAND USE

- Agriculture
- Water management
- Aquaculture

THREATS AND CONSERVATION ISSUES

- Pesticides
- Drainage
- Dredging and canalization
- Agricultural expansion and over-exploitation
- Groundwater abstraction

Kole is one of the largest and most important wetlands of Kerala. It is also one of the most threatened. Reclamation of land and change in land use pattern are the most serious problems. Paddyfields are being converted to coconut, arecanut, and banana plantations and other cash crops at an alarming rate. The marshes are being 'developed' and new constructions are cropping up. At many places, the wetland had been converted to brick-kilns, which once was a profitable small-scale industry. These areas became permanently waterlogged, making it impossible to carry out normal farming activities.

Since 2012, major habitat manipulation is happening at Kole Wetlands by way of infrastructure development, such as widening of the existing bund roads, strengthening of bunds, and construction of additional roads and canals. The sad fact is that such a major habitat intervention is being carried out in the fragile wetland habitat of Kole Wetlands, which is a Ramsar Site, without even undertaking Environmental Impact Assessment, which is mandatory. Even though poaching of birds and mammals has decreased due to constant vigil from birdwatchers and farmers, illegal collection of spawning fish continues.

The indiscriminate use of pesticides affects the bird population. Pesticides are also used to poison and capture birds for meat. Apart from this, setting fire to the natural vegetation in the area adversely affects the breeding habitats of Rallidae, Sylviinae, Ploceinae, and Estrildinae.

Since a large number of people depend on the Kole Wetlands directly and indirectly, and also since huge avian populations are benefited by the site, it should be developed into a multiple-use wetland under the Ramsar Convention, for the wise and sustainable use of its wetland habitats.

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P.O. Nameer, Praveen E.S.

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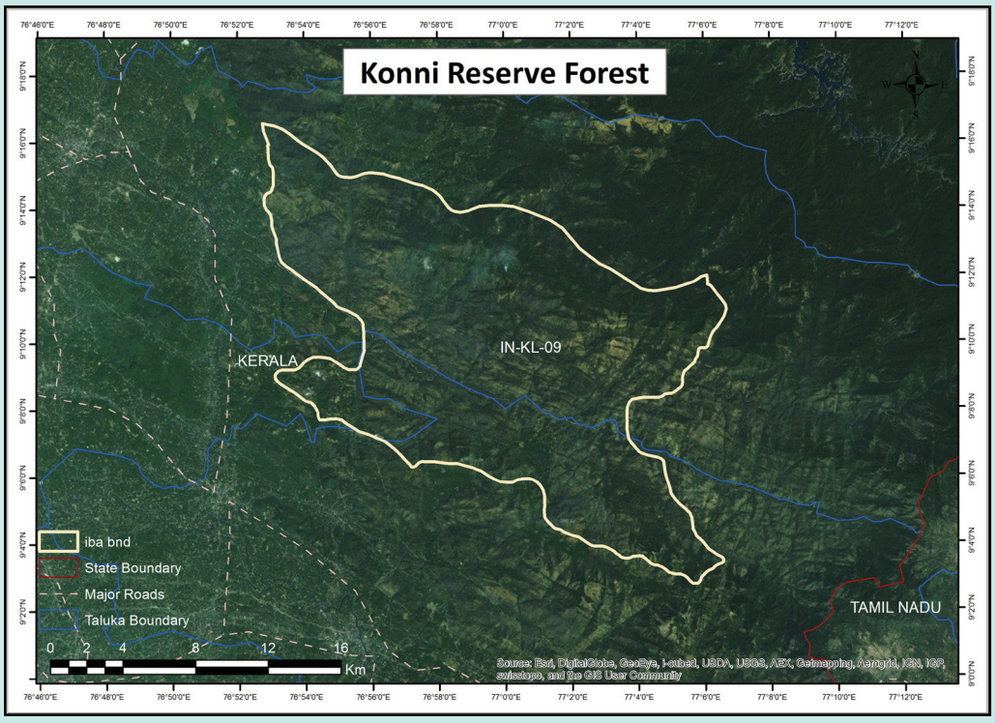
KONNI RESERVE FOREST

IBA Site	: IN-KL-09	**Rainfall**	: 2,210–3,640 mm
Administrative Region (State)	: Kerala	**Temperature**	: 12 °C to 35 °C
District	: Kollam, Pathanamthitta	**Biogeographic Zone**	: Western Ghats
Coordinates	: 9° 03' 00" N, 76° 53' 30" E	**Habitats**	: West Coast Tropical Evergreen, West Coast Semi-evergreen, and Southern Moist Mixed Deciduous Forests, Grasslands
Ownership	: State		
Area	: 33,116 ha		
Altitude	: 60–997 msl		

IBA CRITERIA: A2 (Endemic Bird Area 123: Western Ghats), A3 (Biome 10: Indian Peninsula Tropical Moist Forest)

PROTECTION STATUS: Not officially protected.



GENERAL DESCRIPTION

Konni Reserve Forest (RF), in Karunagappally and Pathanapuram *taluka*s of Kollam district and portions of Kozhencherry and Adoor *taluka*s of Pathanamthitta district lies on the western slopes of the Western Ghats. Therefore, it receives heavy rainfall and bears resulting in Tropical Evergreen and Semi-evergreen forests. Three major rivers and many rivulets originate in Konni RF. The forest area of the Division has hilly terrain, the main hills being Chelikkalkar (997 m), Kodamala (598 m), Thunathumala (721 m), and Iruvallimala (817 m). The numerous ridges and valleys do not have a definite pattern, but on the whole, the area has a north to south aspect.

The climate in the hills is more pleasant than that of the plains. The temperature varies from 11 °C to 35 °C. From January to May it is dry and hot, while March and April are the hottest months. The wet season is from June to November, sometimes with a short break in September. Heavy to very heavy rains are experienced in June-July.

The forest of Konni Forest Division is composed of different forest types, mainly due to the influence of elevation, rainfall, and temperature. Most parts of Konni are covered with close canopy forests, with some lofty evergreen trees above the canopy. Epiphytes, mosses, and orchids grow on these trees, especially in valleys. Due to the dense canopy, ground vegetation is absent in places, but stretches of *Strobilanthus* and ferns may occur. Most of the low-lying areas have been converted into teak plantations (about 8,300 ha).

SAUNAK PAL

Otocryptis beddomii (Boulenger 1885), commonly known as Indian Kangaroo Lizard is the only species found in India of genus *Otocryptis*. It is endemic to the Southern Western Ghats. It is found in Konni Forest Division, Shendurney Wildlife Sanctuary and Peppara Wildlife Sanctuary

AVIFAUNA

Although no detailed study on the biodiversity has been done in Konni RF, it is likely to have many Western Ghats endemics, such as the Malabar Grey Hornbill *Ocyceros griseus*, Nilgiri Wood-pigeon *Columba elphinstonii*, White-bellied Treepie *Dendrocitta leucogastra*, and White-cheeked Barbet *Megalaima viridis*. It also has a good population of Great Pied Hornbill *Buceros bicornis*. Some of the Threatened birds listed by Pittie (2001) from Kollam and Pathanamthitta are given in the table.

Konni RF falls in Biome 10 (Indian Peninsula Tropical Moist Forest) and should have most of the species found in this biome. This Reserve Forest has been included in the IBA list mainly because it still has very good forest cover and must have rich birdlife. There is an urgent need to survey and document the bird fauna of this IBA.

OTHER KEY FAUNA

Konni RF is rich in wildlife. The Tiger *Panthera tigris* has been reported from many parts, but mainly in Thora and Attippara areas near Kokkathodu. Asiatic Elephant *Elephas maximus* is mainly seen in Naduvathumuzhi and Konni Ranges. Other fauna includes Leopard *Panthera pardus,* Wild Dog *Cuon alpinus,* Barking Deer *Muntiacus muntjak*, Sambar *Rusa unicolor*, Mouse Deer *Moschiola indica*, Sloth Bear *Melursus ursinus*, Nilgiri Langur *Semnopithecus johnii*, Tufted Grey Langur *Semnopithecus priam* (NT), Travancore Flying Squirrel *Petinomys fuscocapillus*, and Indian Giant Squirrel *Ratufa indica*.

LAND USE

- Forestry operations
- Plantations

VULNERABLE	
Nilgiri Wood-pigeon	*Columba elphinstonii*
ENDEMIC BIRD AREA 123: WESTERN GHATS	
Nilgiri Wood-pigeon	*Columba elphinstonii*
Malabar Grey Hornbill	*Ocyceros griseus*
Malabar Parakeet	*Psittacula columboides*
Nilgiri Flycatcher	*Eumyias albicaudatus*
Nilgiri Flowerpecker	*Dicaeum concolor*
Malabar Starling	*Sturnia blythii*
White-bellied Treepie	*Dendrocitta leucogastra*
BIOME 10	
White-cheeked Barbet	*Megalaima viridis*
Yellow-browed Bulbul	*Acritillas indica*

THREATS AND CONSERVATION ISSUES

- Plantation
- Agriculture
- Encroachment
- Poaching

Konni RF has suffered logging for more than 150 years. Facility for water transport and availability of good quality timber have led to over-exploitation, but this has been brought under control in recent years. However, large tracts of former lowland tropical rain forests now consist of teak plantations. Some of these plantations are mature and need to be removed. Once this is done, there would be an opportunity to regenerate the natural tropical forest.

KEY CONTRIBUTOR

Forest Department, Kerala

KEY REFERENCE

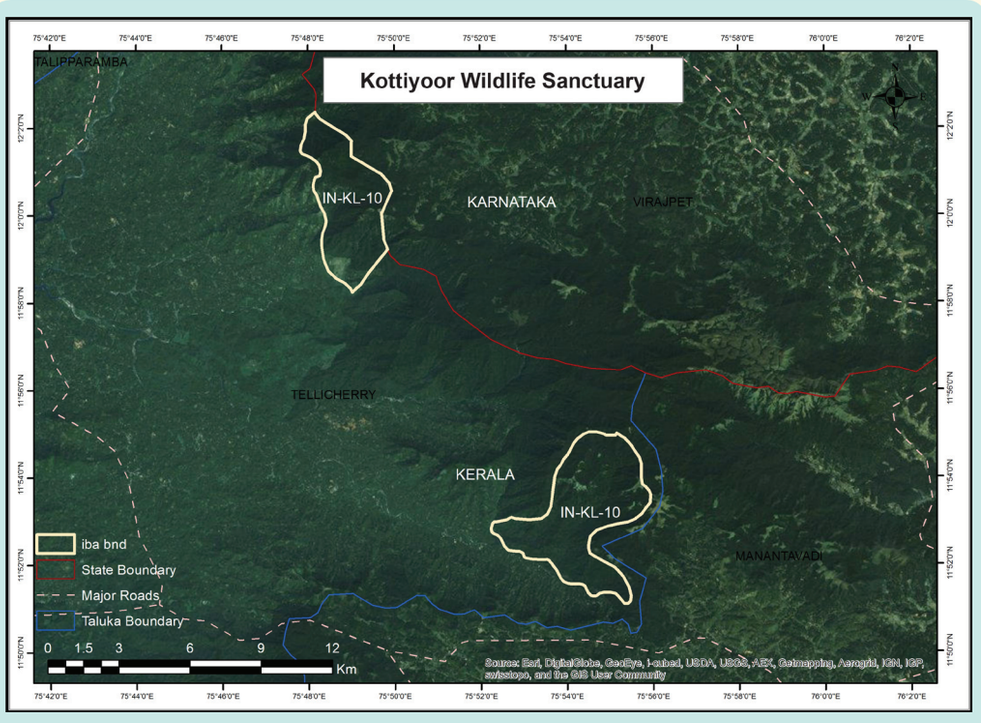
Pittie, A. (2001) Birding notes. *Pitta* 124: 6–7.

KOTTIYOOR WILDLIFE SANCTUARY

IBA Site	: IN-KL-10	**Altitude**	:	70–1,361 msl
Administrative Region (State)	: Kerala	**Rainfall**	:	3,000 mm
District	: Kannur	**Temperature**	:	15 ºC to 38 ºC
Coordinates	: 12º 05' 08" N, 75° 34' 60" E	**Biogeographic Zone**	:	Western Ghats
Ownership	: State	**Habitats**	:	West Coast Tropical Evergreen and Semi-evergreen Forests
Area	: 3,037.98 ha			

IBA CRITERIA: A1 (Threatened species), A2 (Endemic Bird Area 123: Western Ghats), A3 (Biome 10: Indian Peninsula Tropical Moist Forest)

PROTECTION STATUS: Wildlife Sanctuary, notified March, 2011 vide notification G.O.(P) No. 17/2011/F&WLD dated 1 March 2011.



GENERAL DESCRIPTION

Situated on the western slopes of the Brahmagiri Hills, Kottiyoor Wildlife Sanctuary is adjacent to the Aralam Wildlife Sanctuary. It is bounded by the contiguous forests of Aralam and Hilldale Reserve Forest on the east, northeast and northwest sides, while the south and southwest sides of this forest are bordered by thickly populated villages. The main forest types are West Coast Tropical Evergreen and West Coast Tropical Semi-evergreen. A significant extent of this area is covered by grassland at altitudes ranging from 900 to 1,361 msl. A small part (137.18 ha) of the reserve forest was converted to teak plantation; this area was excluded when the wildlife sanctuary was notified. This forest was heavily subjected to selective felling until the early 1970s. The IBA is well watered, with several perennial streams running into Bavalipuzha, a tributary of Valapattanam river.

AVIFAUNA

A total of 179 birds belonging to 43 families were recorded (Sashikumar 2002, Sashikumar *et al.* 2011). This includes two globally Threatened species, Malabar Pied Hornbill *Anthracoceros coronatus* and Indian Broad-tailed Grass-warbler *Schoenicola platyura.* Another globally Threatened species likely to occur here is the Nilgiri Wood-pigeon *Columba elphinstonii* because the habitat is quite suitable for this forest-loving pigeon. Nilgiri Pipit *Anthus nilghiriensis* has also been reported here, but confirmation is needed.

The site lies in the Western Ghats Endemic Bird Area (EBA 123), where Stattersfield *et al.* (1998) have identified

16 restricted-range or endemic species. As this site has good forest cover, and also adjoins other protected areas, 12 endemic species have been identified. Recently, further taxonomic changes have taken place, and now the total number of Western Ghats endemics is 26 (Rasmussen & Anderton 2005, 2012; del Hoyo & Collar 2014). One or two more are likely to be found here, once detailed studies are conducted.

This site is also suitable for biome-restricted assemblages. One of the criteria for the identification of an IBA is that the site is known, or thought to hold, a significant component of a group of species whose distributions are largely or wholly confined to one biome. This site falls in Biome 10 (Indian Peninsula Tropical Moist Forest), where BirdLife International (undated) has listed 15 bird species. Twelve of these 15 biome-restricted species are found in Kottiyoor Reserve Forest (Sashikumar 2002), which further proves the importance of this site as an IBA.

The site also holds a significant population of the Near Threatened Malabar Pied Hornbill *Anthracoceros coronatus*. This species has faced rapid decline in Sri Lanka, and similar losses are occurring in India (BirdLife International 2014).

OTHER KEY FAUNA

Kottiyoor WLS and the surrounding forests harbour a number of Asiatic Elephant *Elephas maximus*. Gaur *Bos gaurus*, Sambar *Rusa unicolor*, and Barking Deer *Muntiacus muntjak* are the main herbivores. Tiger *Panthera tigris* and Leopard *P. pardus* are the major carnivores reported from the site. No study on wildlife has been done in this IBA site.

LAND USE

- Forestry

THREATS AND CONSERVATION ISSUES

- Burning of grasslands
- Poaching
- Unrestricted collection of minor forest produce
- Firewood collection

The presence of vast grasslands, an ecosystem absent from the adjacent Aralam WLS, gives Kottiyoor WLS great conservation value. This forest forms the watershed area of Bavalipuzha, thereby contributing to the water resources of Kannur district.

KEY CONTRIBUTOR

C. Sashikumar

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VULNERABLE	
Indian Broad-tailed Grass-warbler	*Schoenicola platyura*
NEAR THREATENED	
Malabar Pied Hornbill	*Anthracoceros coronatus*
Grey-headed Bulbul	*Microtarsus priocephalus*
ENDEMIC BIRD AREA 123: WESTERN GHATS	
Grey-fronted Green-pigeon	*Treron affinis*
Nilgiri Imperial-pigeon	*Ducula cuprea*
Malabar Parakeet	*Psittacula columboides*
Malabar Grey Hornbill	*Ocyceros griseus*
Malabar Barbet	*Psilopogon malabaricus*
Wynaad Laughingthrush	*Dryonastes delesserti*
Indian Rufous Babbler	*Turdoides subrufus*
Indian Broad-tailed Grass-warbler	*Schoenicola platyura*
White-bellied Blue Flycatcher	*Cyornis pallipes*
Small Sunbird	*Leptocoma minima*
White-bellied Treepie	*Dendrocitta leucogastra*
BIOME 10: INDIAN PENINSULA TROPICAL MOIST FOREST	
Sri Lanka Frogmouth	*Batrachostomus moniliger*
Jerdon's Nightjar	*Caprimulgus atripennis*
Indian Swiftlet	*Aerodramus unicolor*
Malabar Trogon	*Harpactes fasciatus*
White-cheeked Barbet	*Megalaima viridis*
Malabar Barbet	*Psilopogon malabaricus*
Yellow-browed Bulbul	*Acritillas indica*
Malabar Whistling-thrush	*Myophonus horsfieldii*
Indian Scimitar-babbler	*Pomatorhinus horsfieldii*
Dark-fronted Babbler	*Rhopocichla atriceps*
Loten's Sunbird	*Cinnyris lotenius*
Black-throated Munia	*Lonchura kelaarti*

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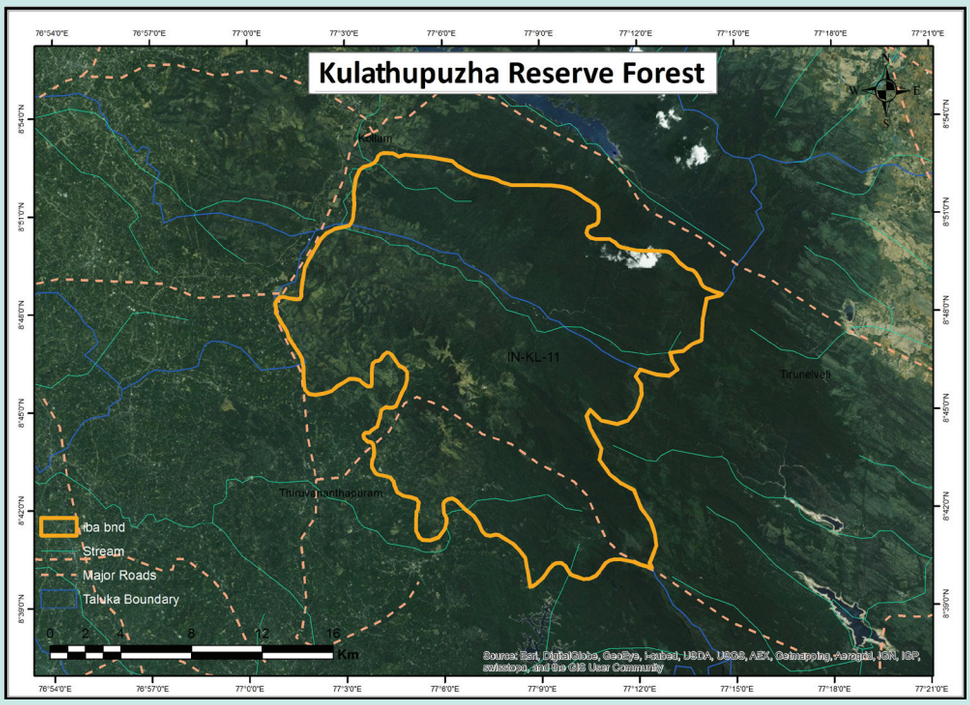
KULATHUPUZHA RESERVE FOREST

IBA Site	: IN-KL-11	**Altitude**	: 500 msl
Administrative Region (State)	: Kerala	**Rainfall**	: 3,200 mm
District	: Kollam, Thiruvananthapuram	**Temperature**	: 16 ºC to 32 ºC
Coordinates	: 08º 54' 54" N, 77º 05' 60" E	**Biogeographic Zone**	: Western Ghats
Ownership	: State	**Habitats**	: Tropical Wet Evergreen Forest, West Coast Semi-evergreen Forest
Area	: 21,900 ha		

IBA CRITERIA: A1 (Threatened species), A2 (Endemic Bird Area 123: Western Ghats), A3 (Biome 10: Indian Peninsula Tropical Moist Forest)

PROTECTION STATUS: Not officially protected.



GENERAL DESCRIPTION

Kulathupuzha Reserve Forest is located between Shendurney Wildlife Sanctuary and the Ponmudi hills. The IBA lies in two revenue districts, namely Kollam and Thiruvananthapuram. The nearest railway station is Kollam, *c.* 70 km at from Kulathupuzha town. The area is connected by Thiruvananthapuram-Shenkottah road and Kollam-Kulathupuzha road.

Kulathupuzha Reserve Forest and its adjoining ranges which have Teak plantations and mixed forests (Evergreen, Semi-evergreen, and Moist Deciduous) host a good floral and faunal diversity. *Anacolosa densiflora*, *Ailanthus malabarica*, *Artocarpus heterophyllus*, *A. hirsuta*, *Calophyllum elatum*, *Canarium strictum*, and *Gluta travancorica* are the interesting tree species of this IBA site. Thick reed beds cover long stretches on the southwestern slopes of Pandimottai, including Pongumala, in Kulathupuzha Range.

The unique *Myristica* swamp forest is found at Vencolla, Amakkulam, and Sasthamnada in this IBA. This type of forest is seen in tropical evergreen forests below 300 m, especially along the bottom of the valley, which is subject to inundation throughout the year due to heavy rainfall. The whole valley floor is often covered with protruding roots of *Myristica*. Kulathupuzha river catchment area bears some of the most pristine extant forests in the state.

AVIFAUNA

A total of 215 species of birds were recorded by P. Manoj in 2001–2002. More than 20% of the total species are migrants, while the rest are local migrants and residents. The globally

NAYAN KHANOLKAR

Grey-headed Bulbul *Pycnonotus priocephalus* is one of the endemic birds of the Western Ghats. It is common in Kulathupuzha Reserve Forest

Threatened Nilgiri Wood-pigeon *Columba elphinstonii* occurs in this site, especially in Pandimottai area.

Kulathupuzha lies in the Western Ghats Endemic Bird Area (EBA 123), where Stattersfield *et al.* (1998) identified 16 restricted-range or endemic species. According to the current classification, 26 endemic birds have been identified in the Western Ghats. Of these 11 have been recorded in this site, which shows that the natural forest cover is still intact.

OTHER KEY FAUNA

Kulathupuzha Reserve Forest has most of the mammals representative of the Western Ghats, including the endemic Nilgiri Langur *Trachypithecus johni*. Asiatic Elephant *Elephas maximus*, Gaur *Bos gaurus*, Sambar *Rusa unicolor*, Barking Deer *Muntiacus muntjak*, Tiger *Panthera tigris*, Leopard *P. pardus*, and Sloth Bear *Melursus ursinus* are known to occur. The Wild Dog *Cuon alpinus* is likely to be seen.

ENDANGERED	
White-bellied Blue Robin	*Myiomela albiventris*
VULNERABLE	
Nilgiri Wood-pigeon	*Columba elphinstonii*
NEAR THREATENED	
Grey-headed Bulbul	*Pycnonotus priocephalus*
Nilgiri Flycatcher	*Eumyias albicaudatus*
ENDEMIC BIRD AREA 123: WESTERN GHATS	
Nilgiri Wood-pigeon	*Columba elphinstonii*
Malabar Parakeet	*Psittacula columboides*
Malabar Grey Hornbill	*Ocyceros griseus*
Grey-headed Bulbul	*Microtarsus priocephalus*
White-bellied Blue Robin	*Myiomela albiventris*
Wynaad Laughingthrush	*Garrulax delesserti*
Indian Rufous Babbler	*Turdoides subrufus*
Nilgiri Flycatcher	*Eumyias albicaudatus*
White-bellied Blue Flycatcher	*Cyornis pallipes*
Small Sunbird	*Leptocoma minima*
White-bellied Treepie	*Dendrocitta leucogastra*

LAND USE

- Plantations
- Forestry operations

THREATS AND CONSERVATION ISSUES

- Human settlements
- Tree felling
- Forest fires
- Poaching
- Grazing of livestock

There are many settlements in the reserve forest, including those of tribals. Owing to anthropogenic pressure, there is constant and permanent ecological degradation of the natural habitats, which affects the flora and fauna. Cattle grazing and commercial forestry also contribute to the degradation. Forest fires during the hot, dry summer in the core area are a constant menace.

Poaching of birds is very common in the fringe areas of the forests, such as Thalappacha, Amakkulam, Mylamood, and Chozhiakode.

KEY CONTRIBUTOR

P. Manoj

KEY REFERENCE

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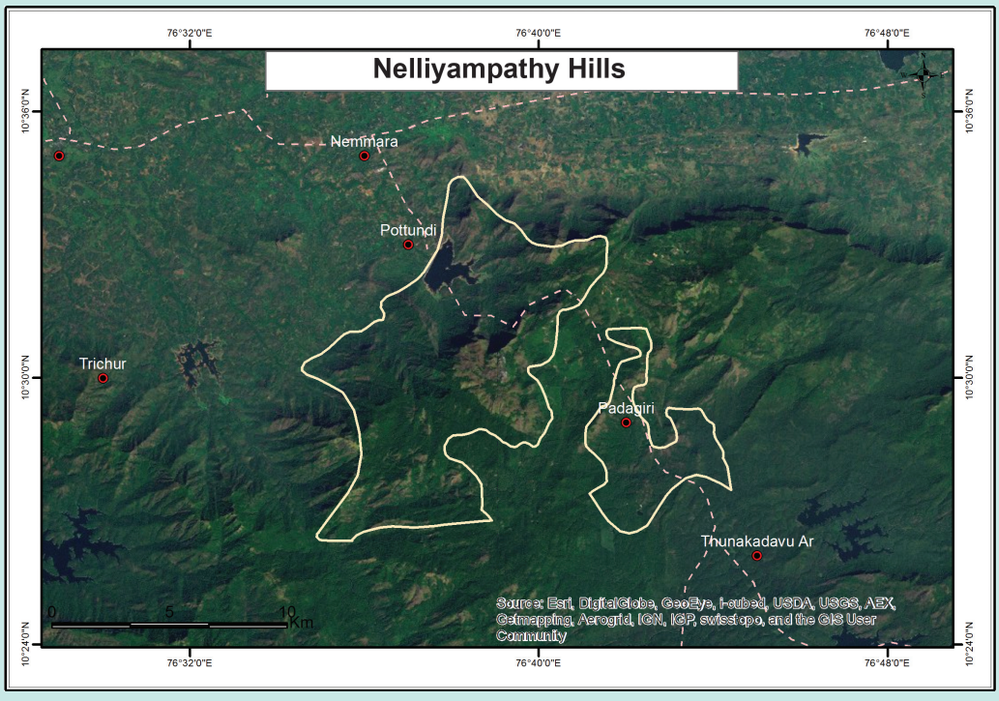
NELLIYAMPATHY HILLS

IBA Site	: IN-KL-12	**Temperature**	: 15 °C to 35 °C
Administrative Region (State)	: Kerala	**Biogeographic Zone**	: Western Ghats
District	: Palakkad	**Habitats**	: Southern Tropical Evergreen Forest, Southern Tropical Semi-evergreen Forest, Subtropical Hill Forest, Tropical Moist Deciduous Forest, Subtropical Montane Grassland, Reservoir
Coordinates	: 10º 34' 00" N, 76° 42' 30" E		
Ownership	: State		
Area	: 20,005 ha		
Altitude	: 120–1,550 msl		
Rainfall	: 3,400 mm		

IBA CRITERIA: A1 (Threatened Species), A2 (Endemic Bird Area 123: Western Ghats), A3 (Biome 10: Indian Peninsula Tropical Moist Forest)

PROTECTION STATUS: Reserve Forest.



GENERAL DESCRIPTION

Nelliyampathy Hills start from the southern and southwestern margin of the Palghat Gap and extend south, enclosing the Parambikulam basin. The western edge of the Nelliyampathy Hills gradually descends to the midlands of Thrissur district through a wide foothill zone drained by Puzhachal and Karuvannur rivers. Topographically, the entire area is hilly. The Kuriarkutty river is formed by the confluence of Thekkady river originating from the private forests of Thekkady, and Vettiar river flowing from the Nelliyampathy forest. The Karapara river also originates from the Nelliyampathy range and joins other rivers to form the main Chalakudy river.

Administratively, these hills falls under Nemmara Forest Division, with two ranges – Nelliampathy (205 sq. km) and Kollengode (51.79 sq. km). During the formation of Parambikulam Tiger Reserve, 42.99 sq. km. of Nelliampathy range was annexed to the core area of Parambikulam Tiger Reserve, while 46.27 sq. km were ear-marked as the buffer zone. These are still a part of Nemmara Division and hence treated here as such.

The Tropical Evergreen Forest of the Nelliyampathy range comprises tree species such as *Palaquium ellipticum*, *Cullenia exarillata*, *Mesua ferrea* and *Drypetes wightii*.

AVIFAUNA

A.P. Kinloch was the first to study the avifauna of Nelliampathy Hills (Kinloch 1921a, 1921b, 1921c, 1923a,

1923b). Sálim Ali visited these hills during his Travancore Cochin bird survey (Ali & Whistler 1935–37). These transects were repeated in 2011 by Sashikumar *et al.* 2011b. An organized bird survey in 2005 covered the entire hills through six base camps (Nameer & Praveen 2006, Praveen & Nameer 2007).

Nearly 110 species of birds are reported from Nelliyampathy (Prasad & Vijayan 2002). Praveen & Nameer (2007) recorded 197 species during their bird study, while 216 species are listed in the checklist by Sashikumar *et al.* (2011a). Sálim Ali recorded 87 species during his visit (Ali &Whistler 1935–37) while the repeat survey by Sashikumar *et al.* (2011b) found 130 species. The 16 species recorded by A.P. Kinloch were not recorded by Praveen & Nameer (2007) –these included two species of vultures. The globally Threatened Nilgiri Wood-pigeon *Columba elphinstonii* is found here but it is not common. Even **Kinloch (1921)** during 1910 to 1920 recorded it as sparse. Zacharias & Gaston (1999) also found it uncommon. Praveen & Nameer (2009) recorded *Columba elphinstonii* at a density of 0.69/1000 birds, indicating a sparse population.

This site lies in the Western Ghats Endemic Bird Area (Stattersfield *et al.* 1998), in which 16 endemic or restricted-range species have been listed. However, after recent taxonomic changes (Rasmussen and Anderton 2005 2012; del Hoyo and Collar 2014), the number of endemic birds in the Western Ghats has increased to 25-26. In this IBA, 16 of these 25-26 endemics have been found. The hills house two Vulnerable and nine Near Threatened species, and 14 of the 15 species list in Biome 10 (Indian Peninsula Tropical Moist Forest).

The Indian Broad-tailed Grass-warbler *Schoenicola platyurus* is listed as Vulnerable by BirdLife International (2001). It is one of the four threatened members of the suite of 16 bird species that are entirely restricted to the Western Ghats Endemic Bird Area (Stattersfield *et al.* 1998). In the Western Ghats, shola grassland areas are heavily overgrazed and this is a major concern for this grassbird and the Vulnerable Nilgiri Pipit *Anthus nilghiriensis* which breeds in these hills (Sashikumar *et al.* 2011a). However, Robin *et al.* (2014) consider all reports from elevations below *c.*1800 m as suspect and hence confirmation is desirable. The Broad-tailed Grassbird, in particular, frequents tall grass (BirdLife International 2014). J. Praveen (*in litt.* 2003) saw 4–5 birds in the grassland, flitting among the grass. One was perched on a rock, delivering a lark-like warbling song. Mudappa & Raman (2009) consider Nelliampathy to be an important refuge for Malabar Pied and Great Pied Hornbills. Black-headed Ibis *Threskiornis melanocephalus* and River Tern *Sterna aurantia* occur in the Pothundy reservoir during winter months. and the latter is probably breeding in the islands during summer. These hills form the northernmost range of Palni Laughingthrush *Strophocincla fairbanki fairbanki* which has small populations in Nellikkulam and Minnampara (Nameer & Praveen 2006). But subsequent surveys did not reveal this bird (Sashikumar *et al.* 2011b). The Mountain Hawk-Eagle *Nisaetus nipalensis kelaarti*, a future potential split and probably Near Threatened species, was recorded thrice by Sashikumar *et al.* (2011b).

VULNERABLE	
Nilgiri Wood-pigeon	*Columba elphinstonii*
Indian Broad-tailed Grass-warbler	*Schoenicola platyurus*
NEAR THREATENED	
Black-headed Ibis	*Threskiornis melanocephalus*
Pallid Harrier	*Circus macrourus*
River Tern	*Sterna aurantia*
Malabar Pied Hornbill	*Anthracoceros coronatus*
Great Pied Hornbill	*Buceros bicornis*
Grey-headed Bulbul	*Microtarsus priocephalus*
Kerala Laughingthrush	*Strophocincla fairbanki*
Black-and-Orange Flycatcher	*Ficedula nigrorufa*
Nilgiri Flycatcher	*Eumyias albicaudata*
ENDEMIC BIRD AREAS 123: WESTERN GHATS	
Nilgiri Wood-pigeon	*Columba elphinstonii*
Nilgiri Imperial-pigeon	*Ducula cuprea*
Grey-fronted Green-pigeon	*Treron affinis*
Malabar Parakeet	*Psittacula columboides*
Malabar Grey Hornbill	*Ocyceros griseus*
Grey-headed Bulbul	*Microtarsus priocephalus*
Malabar Barbet	*Psilopogon malabaricus*
Wynaad Laughingthrush	*Dryonastes delesserti*
Kerala Laughingthrush	*Strophocincla fairbanki*
Indian Rufous Babbler	*Turdoides subrufus*
Indian Broad-tailed Grass-warbler	*Schoenicola platyurus*
Black-and-orange Flycatcher	*Ficedula nigrorufa*
Nilgiri Flycatcher	*Eumyias albicaudata*
White-bellied Blue Flycatcher	*Cyornis pallipes*
Small Sunbird	*Leptocoma minima*
White-bellied Treepie	*Dendrocitta leucogastra*
BIOME 10 INDIAN PENINSULA TROPICAL MOIST FOREST	
Sri Lanka Frogmouth	*Batrachostomus moniliger*
Jerdon's Nightjar	*Caprimulgus atripennis*
Indian Swiftlet	*Collocalia unicolor*
Malabar Trogon	*Harpactes fasciatus*
Malabar Pied Hornbill	*Anthracoceros coronatus*
White-cheeked Barbet	*Megalaima viridis*
Malabar Barbet	*Psilopogon malabaricus*
Hill Swallow	*Hirundo domicola*
Yellow-browed Bulbul	*Acritillas indica*
Malabar Whistling-thrush	*Myophonus horsfieldii*
Dark-fronted Babbler	*Rhopocichla atriceps*
Indian Scimitar-babbler	*Pomatorhinus horsfieldii*
Loten's Sunbird	*Cinnyris lotenius*
Black-throated Munia	*Lonchura kelaarti*

OTHER KEY FAUNA

Not much informtion is available, but most of the larger and smaller mammals, reptiles and amphibians of the southern Western Ghats are likely to occur here. The

hills are known to have a good population of Lion-tailed Macaque *Macaca silenus*, while grasslands around the high peaks have small numbers of Nilgiri Tahr *Nilgiritragus hylocrius*. Renowned for its amphibian fauna, several new species including *Raorchestes marki* (Biju & Bossuyt, 2009), *R. kaikatti* (Biju & Bossuyt, 2009), *Nyctibatrachus acanthodermis* (Biju *et al.* 2011) and *N. devein* have been described from these hills. The rare and endangered amphibian *Nasikabatrachus sahyadrensis* has been reported from this site (Zachariahs *et al.* 2012).

LAND USE

- Plantation
- Agriculture
- Tourism

THREATS AND CONSERVATION ISSUES

- Agriculture
- Plantation (monoculture)
- Construction
- Plywood industry
- Tourism

According to Chandrashekara *et al.* (2002), a substantial portion of this forest has been encroached and cleared for agriculture, construction of hydroelectric projects, and monoculture plantations of hill produce like cardamom, coffee, tea, teak, and rubber.

Mathew *et al.* (2002) have also found that the establishment of agricultural plantations of coffee, cardamom, and tea are the major disturbance to fauna at Nelliyampathy. According to their investigations, out of 20,005 ha of this forest, 3,956 ha land is leased out to private agencies for such plantation programmes. In order to provide partial shade to the crops, the trees and the understorey vegetation in the leased forestlands have been selectively removed. The most important conservation strategy for Nelliyampathy is the restoration of the altered habitats.

According to Prasad & Vijayan (2002), Nelliyampathy, with its high conservation value, needs to be considered for addition to Parambikulam Wildlife Sanctuary. Nameer & Praveen (2006) found the terrestrial insectivore population highly dwindled and attribute it to the large-scale use of pesticides in the adjoining estates.

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Praveen J.

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P.O. NAMEER

Nelliyampathy has one of the best Tropical Evergren Forest, Semi-evergreen Forest and Subtropical Hill Forest left in Kerala

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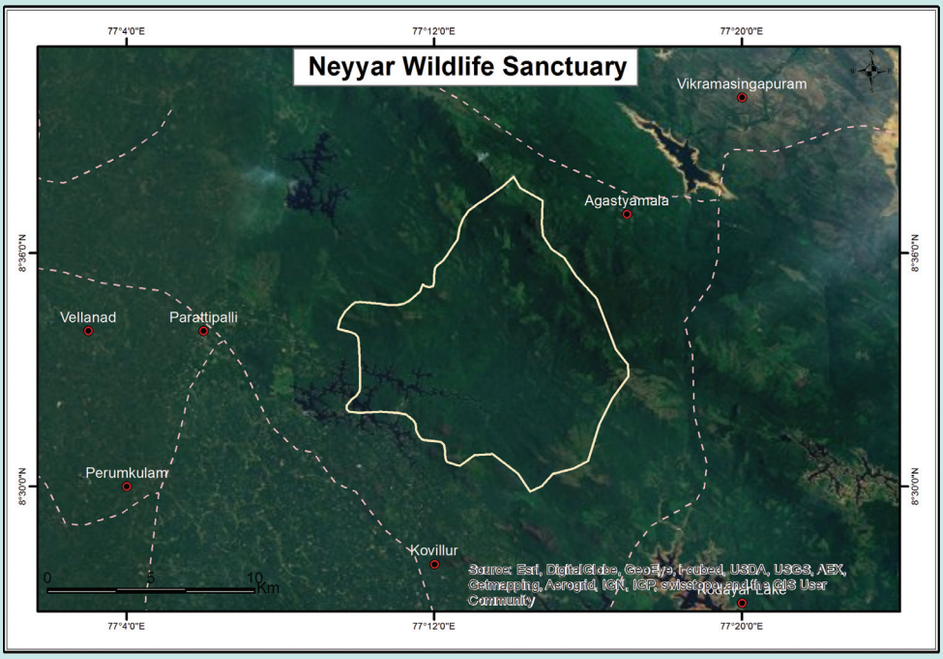
NEYYAR WILDLIFE SANCTUARY

IBA Site	:	IN-KL-13	**Rainfall**	: 2,800 mm
Administrative Region (State)	:	Kerala	**Temperature**	: 16 ºC to 35 ºC
District	:	Thiruvananthapuram	**Biogeographic Zone**	: Western Ghats
Coordinates	:	8º 38' 38" N, 77º 11' 20" E	**Habitats**	: Tropical Wet Evergreen Forest, Tropical Semi-evergreen Forest, Tropical Moist Deciduous Forest, Montane Evergreen (Shola), Montane Grasslands, Ochlandra beds
Ownership	:	State		
Area	:	12,800 ha		
Altitude	:	90–1,858 msl		

IBA CRITERIA: A1 (Threatened species), A2 (Endemic Bird Area 123: Western Ghats), A3 (Biome 10: Indian Peninsula Tropical Moist Forest)

PROTECTION STATUS: Reserve Forest.



GENERAL DESCRIPTION

This IBA is located on the western slopes of the Western Ghats, along the southeast corner of Kerala in Neyyattinkara *taluka* of Thiruvananthapuram district. The sanctuary forms the catchment area of Neyyar Reservoir which was built in 1958. The reservoir has numerous creeks and islets, forming ideal habitats for birds. The forest is more or less contiguous with a vast stretch of protected areas: Peppara WLS (IBA) to the north, revenue land to the south and west, and Kalakkad-Mundathurai Tiger Reserve (IBA) in Tamil Nadu. The climate in the sanctuary is moderately hot and humid, with low temperatures. The high hills are cooler and drier than the foothills and valleys. Due to the varied climatic and topographic conditions, the sanctuary harbours a remarkable diversity of vegetation.

This IBA has West Coast Tropical Evergreen type vegetation, mainly seen in Thalamuttiappy and Sooryanthanakuzhi; Southern Hilltop Tropical Evergreen, found above 1,000 m on top of the hills and in sholas; West Coast Semi-evergreen, mainly seen on the banks of major rivers and streams; and Southern Moist Mixed Deciduous Forest over more than 60% of the tract along the lower hillslopes. Jain & Sastry (1983) studied the vegetation of this sanctuary. They suggest that much of the moist deciduous forest may have resulted from degradation of the original evergreen forest. The sanctuary has several rare, endemic, medicinal plants (Henry *et al*. 1984) such as *Bentinckia condapanna*, *Poeciloneuron pauciflorum*, *Eugenia floccosa*,

Eugenia discifera, *Ardisia missionis, Hetaeria ovalifolia* and *Chiloschista glandulosa*.

AVIFAUNA

More than 172 species of birds have been reported from Neyyar WLS by Nair (1993), who once found 18 species of birds feeding on a *Ficus* tree, which reflects the avian diversity of this site. A bird survey in December, 2010 recorded 169 species from seven different sites (Nameer *et al.* 2011). If detailed investigation is conducted, with mist netting for identification of warbler species, this checklist would probably increase by another hundred species. Agasthyakoodam peak and its immediate surroundings are particularly rich in endemic avifauna.

Neyyar WLS has the usual complement of Threatened, restricted-range and biome species, like other similar forests in Kerala.

Based on taxonomic changes, now 26 species are considered as endemic to the Western Ghats (Rasmussen and Anderton 2012). In Neyyar, 19 of these endemic species are found, including the globally Threatened Nilgiri Wood-pigeon. This is one of the sites in the southern Western Ghats where race *meridionale* of Kerala Laughingthrush *Strophocincla fairbanki* occurs. Rasmussen and Anderton (2005) consider it as a full species and term it *Trochalopteron fairbanki*. Nameer and Praveen (2012) have termed it Travancore Laughingthrush *Strophocincla meridionale*.

BirdLife International (undated) has also categorized birds according to biome assemblages. Neyyar lies in Biome 10 (Indian Peninsula Tropical Moist Forest), which is represented by 15 species. In Neyyar, 12 of these are seen. The biome species are generally not rare, and quite well-distributed in a particular biome.

This site has been selected as an IBA as it qualifies on the basis of three criteria: A1 (Threatened species), A2 (restricted-range or endemic species), and A3 (Biome-restricted assemblages).

ENDANGERED	
White-bellied Blue Robin	*Myiomela albiventris*
VULNERABLE	
Nilgiri Wood-pigeon	*Columba elphinstonii*
Indian Broad-tailed Grass-warbler	*Schoenicola platyurus*
NEAR THREATENED	
Lesser Fish-eagle	*Ichthyophaga humilis*
Oriental Darter	*Anhinga melanogaster*
Great Pied Hornbill	*Buceros bicornis*
Grey-headed Bulbul	*Microtarsus priocephalus*
Travancore Laughingthrush	*Strophocincla meridionale*
Nilgiri Flycatcher	*Eumyias albicaudatus*
Black-and-Orange Flycatcher	*Ficedula nigrorufa*
ENDEMIC BIRD AREA 123: WESTERN GHATS	
Nilgiri Wood-pigeon	*Columba elphinstonii*
Grey-fronted Green-pigeon	*Treron affinis*
Malabar Parakeet	*Psittacula columboides*
Malabar Grey Hornbill	*Ocyceros griseus*
Malabar Barbet	*Psilopogon malabaricus*
Grey-headed Bulbul	*Microtarsus priocephalus*
Flame-throated Bulbul	*Pycnonotus gularis*
Indian Broad-tailed Grass-warbler	*Schoenicola platyurus*
Indian Rufous Babbler	*Turdoides subrufa*
Travancore Laughingthrush	*Strophocincla meridionale*
Malabar Starling	*Sturnia blythii*
Nilgiri Thrush	*Zoothera neilgherriensis*
White-bellied Blue Robin	*Myiomela albiventris*
Black-and-Orange Flycatcher	*Ficedula nigrorufa*
Nilgiri Flycatcher	*Eumyias albicaudatus*
White-bellied Blue Flycatcher	*Cyornis pallipes*
Nilgiri Flowerpecker	*Dicaeum concolor*
Small Sunbird	*Leptocoma minima*
White-bellied Treepie	*Dendrocitta leucogastra*
BIOME 10: INDIAN PENINSULA TROPICAL MOIST FOREST	
Sri Lanka Frogmouth	*Batrachostomus moniliger*
Jerdon's Nightjar	*Caprimulgus atripennis*
Indian Swiftlet	*Aerodramus unicolor*
Malabar Trogon	*Harpactes fasciatus*
White-cheeked Barbet	*Megalaima viridis*
Malabar Barbet	*Psilopogon malabaricus*
Yellow-browed Bulbul	*Acritillas indica*
Hill Swallow	*Hirundo domicola*
Indian Scimitar-babbler	*Pomatorhinus horsfieldii*
Dark-fronted Babbler	*Rhopocichla atriceps*
Malabar Whistling-thrush	*Myophonus horsfieldii*
Loten's Sunbird	*Cinnyris lotenius*

OTHER KEY FAUNA

The sanctuary has a variety of other fauna. The evergreen forests, contiguous with the adjoining protected areas of Tamil Nadu, support viable populations of the Endangered Lion-tailed Macaque *Macaca silenus* and Nilgiri Langur *Trachypithecus johni*. Other arboreals mammals include Bonnet Macaque *Macaca radiata* and Indian Giant Squirrel *Ratufa indica*. Nilgiri Tahr *Hemitragus hylocrius* is seen on the higher peaks in the area. The Asiatic Elephant *Elephas maximus* and Sambar *Rusa unicolor* are the most commonly seen mammals. Gaur *Bos gaurus*, Barking Deer *Muntiacus muntjak*, Mouse Deer *Moschiola indica*, Sloth Bear *Melursus ursinus*, Toddy Cat *Paradoxurus hermaphroditus*, Common Otter *Lutra lutra*, Dhole *Cuon alpinus*, Golden Jackal *Canis aureus*, Grey Slender Loris *Loris lydekkerianus*, Indian Pangolin *Manis crassicaudata*, and Wild Boar *Sus scrofa* are regularly sighted. Tiger *Panthera tigris* and Leopard *P. pardus* are also reported from the sanctuary.

LAND USE

- Agriculture
- Socio-economic
- Ecotourism

DHRITIMAN MUKHERJEE

In Neyyar 19 endemic species of the Western Ghats are found, including Black-and-Orange Flycatcher *Ficedula nigrorufa*

THREATS AND CONSERVATION ISSUES

- Collection of firewood and other resources
- Tourism and recreation
- Grazing
- Agriculture

Neyyar WLS encompasses the catchment area of the Neyyar Dam, which is part of an irrigation scheme for Kerala and Tamil Nadu. Its suitability for nomination as a biosphere reserve has been assessed (Henry *et al.* 1984). Large numbers of people have settled in and around the sanctuary, especially in the southern catchment area of Neyyar Reservoir. Both hill tribes and settlers put tremendous pressure on the environment by cattle grazing, illicit felling of trees, removal of minor forest produce, and by starting fires. Pilgrims travelling to Agasthyamalai Peak put additional pressure on the biotic resources. During the pilgrimage season, a large number of pilgrims camp inside the forest and prepare food in the core area. As Neyyar is scenically and biologically rich, it could be developed into a major tourist destination. However, this should be done with careful planning, so that additional pressure is not put on the resources.

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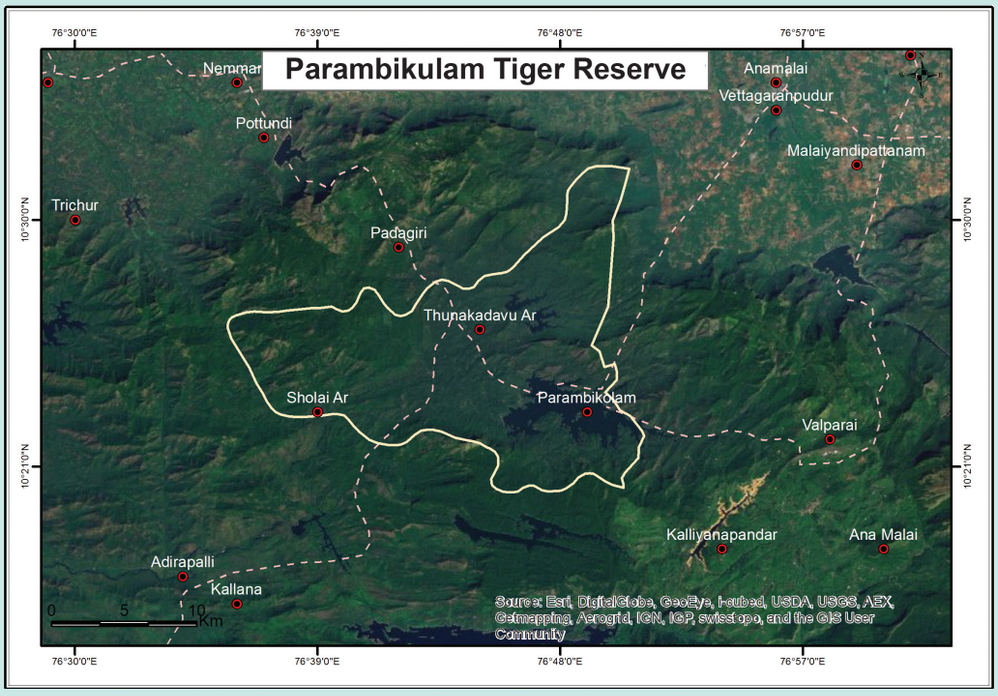
PARAMBIKULAM TIGER RESERVE

IN-KL-14

IBA Site	: IN-KL-14	**Altitude**	: 300–1,438 mm
Administrative Region (State)	: Kerala	**Rainfall**	: 1,400-2.300 mm
District	: Palakkad	**Temperature**	: 15 ºC to 32 ºC
Coordinates	: 76º 35’ 76° 50’ E, 10° 20’ 10° 26’ N	**Biogeographic Zone**	: Western Ghats
Ownership	: State	**Habitats**	: Tropical Wet Evergreen, Tropical Semi Evergreen, Tropical Moist Deciduous Tropical Dry Deciduous Forests, Sholas, Savannah (Vayals)
Area	: 28,500 ha		

IBA CRITERIA: A1 (Threatened species), A2 (Endemic Bird Area 123: Western Ghats), A3 (Biome-10: Indian Peninsula Tropical Moist Forest)

PROTECTION STATUS: Wildlife Sanctuary, established in November 1984, Tiger Reserve established in 2009



GENERAL DESCRIPTION

Parambikulam Wildlife Sanctuary in the Palakkad district of Kerala, came into existence in 1962 when an area of 69.8 sq. km of the Sungam Range of Nemmara Forest Division was declared as a Sanctuary. Parambikulam Range of the Division of Teak Plantation was added to this in 1973, and final notification was done in 1984. In 2009, the Tiger Reserve was notified with a spread of 643,66 sq.km. that includes a core area of 390.89 sq. km of which parts from the neighbouring territorial divisions of Nemmara (42.99 sq. km), Chalakudy (42.24 sq.km) and Vazhachal (60.53 sq.km) were included. These are not yet fully transferred to the administration of the Tiger Reserve. Erstwhile Parambikulam WLS occupies 285 sq. km of which 245 sq. km is core area and rest ear-marked for buffer and tourism. Parambikulam WLS is adjacent to Indira Gandhi Wildlife Sanctuary (IBA) in Tamil Nadu, Nelliampathy (=Nelliyampathy) Reserve Forests (IBA) of Nemmara Forest Division to the northwest, and the Vazhachal RF (IBA) to the southwest and south (Vijayan 1979). It is part of a large area of forest comprising Anamalai, Nelliampathy, Sholayar High Ranges and Palni Hills.

The area in general slopes towards the west, the highest peak being Karimala Gopuram (1,438 m) (triangulation station of the Survey of India), while the lowest area is 300 m above msl on the bank of Chalakudi.

Inside the Reserve area, three dams of the Parambikulam Aliyar Project were constructed in 1960 for irrigation and

power generation, and are still under the administrative control of the Tamil Nadu State Government.

The vegetation comprises of a variety of natural and man-made habitats. The former includes patches of Evergreen and Semi-evergreen forest, Secondary Moist Deciduous forest, which is widely distributed, and grasslands and marshes. The original Moist Deciduous vegetation in the eastern parts has been almost entirely replaced by teak plantations (Anon. 1982). The marshes, or *vayals*, with their dense grass cover, are the result of poor drainage and accumulation of loamy soil over a long period of time. Stands of Bamboo *Bambusa* sp. and reeds *Ochlandra* sp. occur in the natural forests. The best natural Teak *Tectona grandis* in Kerala was once found in this region but is now rare due to over-exploitation. The major species occurring in the Evergreen and Moist Deciduous forests are listed in Balakrishnan and Easa (1986) and Vijayan (1979). There is thick growth of *Lantana camara* in clearings, and of *Eupatorium* sp. in teak plantations, particularly where the plantations have failed.

AVIFAUNA

The first avifaunal survey of the region was done by Dr. Salim Ali during his 1933 Cochin survey where he recorded 88 species. Of significance was the collection of Legge's Hawk-Eagle *N. kelaarti* from these forests. A repeat survey in 2009 (Sashikumar *et al.* 2009) recorded 158 species – and their transects apparently included more sites in the sanctuary. Two coordinated bird surveys have happened in Parambikulam covering ten base camps; the one in 1994 recorded 211 species (NEST & KFRI 1994) while another in 2006 recorded two species not recorded earlier (Nameer & Praveen 2007). Certain parts of the sanctuary has been well-visited by birders that has taken the combined list of birds to 236 (Sashikumar *et al.* 2011).

Parambikulam is well-known for its excellent population of Great Pied Hornbill *Buceros bicornis*. Muduppa & Raman (2009) recommends Parambikulam landscape as an important habitat for this species in the Western Ghats. Malabar Pied Hornbill has been recorded in the fringes of the sanctuary, and in the core areas included from Chalakudy and Vazhachal divisions into the Tiger Reserve. This is one of the very few sites in Kerala from where Lesser Adjutant *Leptoptilos javanicus* has been reported, a few birds still survive in the remaining *vayals* which have not been taken over by Teak plantations.

The site lies in the Western Ghats Endemic Bird Area (EBA) (Stattersfield *et al.* 1998). In this EBA, 16 species have been identified which have restricted range of less than 50,000 sq. km. Most of them are forest birds. Ten of these restricted range species are known from this site. According to the latest classification (Rasmuseen and Anderton 2012; BirdLife International 2014), there are 26 endemic bird species in the Western Ghats.

VULNERABLE	
Nilgiri Wood-pigeon	*Columba elphinstonii*
Lesser Adjutant	*Leptoptilos javanicus*
Asian Woollyneck	*Ciconia episcopus*

NEAR-THREATENED	
Great Pied Hornbill	*Buceros bicornis*
Malabar Pied Hornbill	*Anthracoceros coronatus*
Lesser Fish-eagle	*Haliaeetus humilis*
River Tern	*Sterna aurantia*
Oriental Darter	*Anhinga melanogaster*
Grey-headed Bulbul	*Microtarsus priocephalus*
Nilgiri Flycatcher	*Eumyias albicaudatus*

ENDEMIC BIRD AREA 123: WESTERN GHATS	
Nilgiri Wood-pigeon	*Columba elphinstonii*
Malabar Parakeet	*Psittacula columboides*
Malabar Grey Hornbill	*Ocyceros griseus*
Wynaad Laughingthrush	*Dryonastes delesserti*
Indian Rufous Babbler	*Turdoides subrufus*
Grey-headed Bulbul	*Microtarsus priocephalus*
White-bellied Blue Flycatcher	*Cyornis pallipes*
Nilgiri Flycatcher	Eumyias albicaudata
Small Sunbird	*Leptocoma minima*
White-bellied Treepie	*Dendrocitta leucogastra*

BIOME-10: INDIAN PENINSULA TROPICAL MOIST FOREST	
Blue-faced Malkoha	*Phaenicophaeus viridirostris*
Sri Lanka Frogmouth	*Batrachostomus moniliger*
Malabar Trogon	*Harpactes fasciatus*
Malabar Pied Hornbill	*Anthracoceros coronatus*
White-cheeked Barbet	*Megalaima viridis*
Malabar Whistling-thrush	*Myiophonus horsfieldii*
Dark-fronted Babbler	*Rhopocichla atriceps*
Black-throated Munia	*Lonchura kelaarti*

Based on the biome classification of BirdLife International (undated), this site should fall in Biome-10 (Indian Peninsula Tropical Moist Forest). Out of the 15 species of this biome-restricted assemblage, eight have been found at Parambikulam till now. Detailed avifaunal investigation is required in higher altitude wet evergreen forests.

OTHER KEY FAUNA

The Sanctuary harbours almost all representatives of the larger species of peninsular Indian mammals. Major carnivores include Tiger *Panthera tigris*, Leopard *P. pardus* and Indian Wild Dog *Cuon alpinus*. Large herds of Asiatic Elephant *Elephas maximus* are often seen. Herbivores are represented by Gaur *Bos gaurus*, Sambar *Rusa unicolor*, Chital *Axis axis* and Muntjak *Muntiacus muntjak*. There are reports of Mouse Deer *Moschiola indica*. All the four non-human primates found in Kerala are present in

Parambikulam: Bonnet Macaque *Macaca radiata*, Lion-tailed Macaque *M. silenus*, Nilgiri Langur *Semnopithecus johni* and Tufted Grey Langur *Semnopithecus priam*, Sloth Bear *Melursus ursinus* is quite common. Parambikulam is perhaps the best site to see large herds of Gaur in peninsular India. A small herd of 15-25 Nilgiri Tahr *Nilgiritragus hylocrius* is found on Vengoli-PambanMalai (Balakrishnan and Easa 1986; Mishra and Johnsingh 1994).

Vijaykumar *et al*. (2014) collected a bush-frog in August 2011, in a wet evergreen forest fragment in Valpari Plateau which was found to be new to science. They named it *Raorchestes emeraldi* after its dominant emerald colour on the dorsal side. It appears to be a forest species, occurring mainly from 1200-1400 m elevation. Another species of bush-frog, named *Raorchestes blandus* was discovered on the western slopes of Anaimalai Massif in Parambikulam TR in a fragmented lowland evergreen forest.

LAND USE

- Nature conservation and research
- Tourism

THREATS AND CONSERVATION ISSUES

- Tourism and recreation
- Grazing
- Fuelwood collection
- Human habitation
- Invasive species (*Tilapia*)

This IBA site suffers from a plethora of problems, all related to human activities. Easa and Balakrishnan (1983) have discussed conservation problems in great detail. According to them, cattle grazing in certain areas is a perennial problem, and is increasing due to human settlements. Related to this is the fire during summer months. This is leading to spread of weeds and fire-resistant non-palatable species. This problem needs detailed study. Perhaps rotational burning, which establishes a mosaic of burnt and unburnt grasslands during the dry season can be tried in the Sanctuary (Easa and Balakrishnan 1983).

Mathew *et al.* (2002) considered raising of teak plantations after clear-felling extensive areas of natural forests as the major disturbance at Parambikulam. However, being a wildlife sanctuary, these plantations are left without much weeding or extraction of miscellaneous tree species and this has led to the formation of mixed stands over years. In the absence of any further disturbance, the altered forest biota is slowly returning to its normal condition.

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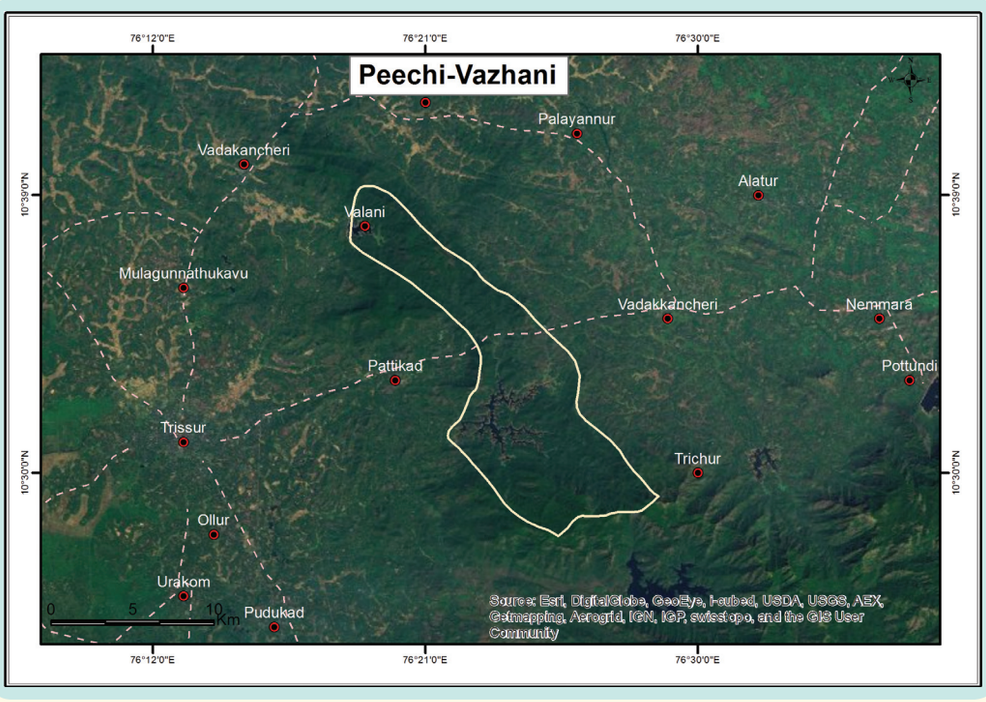
PEECHI-VAZHANI WILDLIFE SANCTUARY

IBA Site	: IN-KL-15	**Altitude**	: 45–922 m
Administrative Region (State)	: Kerala	**Rainfall**	: 3,000 mm
District	: Thrissur	**Temperature**	: 18 ºC to 39 ºC
Coordinates	: 10º 26' N to 76° 15' E to 76° 28' E	**Biogeographic Zone**	: Western Ghats
Ownership	: State	**Habitats**	: West Coast Tropical Evergreen Forest, West Coast Semievergreen Forest, Southern Indian Moist Deciduous Forest
Area	: 12,500 ha		

IBA CRITERIA: A1 (Threatened species), A2 (Endemic Bird Area 123: Western Ghats), A3 (Biome 10: Indian Peninsula Tropical Moist Forest)

PROTECTION STATUS: Wildlife Sanctuary, established in August 1958.



GENERAL DESCRIPTION

The Peechi-Vazhani Wildlife Sanctuary falls in Thrissur district in Kerala, the *taluka*s being Trichur and Thalapilly. The sanctuary was formed in 1958 by combining some portions of Peechi, Pattikkad, and Machad ranges of Trichur Forest Division. The sanctuary includes parts of Paravattanimala Reserve, Machadmala Reserve, and Bharanipachamala Reserve.

Two dams are present within the sanctuary, namely, Peechi dam and Vazhani dam, with a waterspread of 1,295 ha and 184.3 ha, respectively. The terrain is undulating, and the altitude varies from 45 to 945 m, with the highest peak Ponmudi at 945 m *c.* msl. The sanctuary is contiguous with the Chimmony Wildlife Sanctuary (IBA) to the east and the forests of Palakkad to the north. But the continuity of the Peechi Forest Range with Vazhani has been lost due to the Trichur-Palakkad national highway (NH 47) (George 2002).

AVIFAUNA

The first ever bird survey at Peechi-Vazhani reported 186 species of birds (Easa 1991), while Santharam (2006) reported 219 species of birds from Peechi. Another bird survey was done during November 2006 (Nameer & Nirmal 2007) and the total number of bird species from these three studies comes to 228.

However, some of the spices sighted by Easa (1991) and Santharam (2006) could not be located during the

survey by Nameer & Nirmal (2007). These include Jerdon's Baza *Aviceda jerdoni*, Chestnut-winged Crested Cuckoo *Clamator coromandus*, Sri Lanka Frogmouth *Batrachostomus moniliger*, Oriental Dwarf Kingfisher *Ceyx erithacus*, Great Pied Hornbill *Buceros bicornis*, White-bellied Woodpecker *Dryocopus javensis*, Wynaad Laughingthrush *Dryonastes delesserti*, Indian Broad-tailed Grass-warbler *Schoenicola platyurus*, and a few others. Some these species such as Sri Lanka Frogmouth, Oriental Dwarf Kingfisher, Great Pied Hornbill, White-bellied Woodpecker have been sighted from adjacent areas and are likely to be seen in Peechi-Vazhani WLS. However, sighting of the Vulnerable Indian Broad-tailed Grass-warbler *Schoenicola platyurus* during the 1991 bird survey was considered doubtful and but later confirmed by Nameer & Nirmal (2007).

Six Near Threatened species of birds are found in this site, and 15 out of 26 restricted-range or endemic species of the Western Ghats EBA are found here.

The site lies in Biome 10 (Indian Peninsula Tropical Moist Forest), where BirdLife International (undated) has listed 15 species that represent this biome assemblage. Out of these, 11 species have been reported from Peechi-Vazhani IBA.

Interestingly, this IBA is an important wintering area for many subtropical and temperate birds of the Himalaya, such as the Large-crowned Leaf-warbler *Phylloscopus occipitalis,* Rufous-tailed Flycatcher *Muscicapa ruficauda,* Blue-capped Rock-thrush *Monticola cinclorhynchus,* Pied Thrush *Zoothera wardii*, and Brown-breasted Flycatcher *Muscicapa muttui.*

OTHER KEY FAUNA

Among the primates, Bonnet Macaque *Macaca radiata*, Nilgiri Langur *Semnopithecus johni*, and Grey Slender Loris *Loris lydekkerianus* are very often observed in the Evergreen, Semi-evergreen and Moist Deciduous areas of the sanctuary. Tiger *Panthera tigris*, Leopard *P. pardus*, and Jungle Cat *Felis chaus* are among the felines present in the sanctuary. Canids are represented by the Golden Jackal *Canis aureus*. Bovids present include the Gaur *Bos gaurus*. Cervids include Chital *Axis axis*, Sambar *Rusa unicolor*, and Barking Deer *Muntiacus muntjak*. Asiatic Elephant *Elephas maximus* is also found, though not in good numbers. Giant Squirrel *Ratufa indica* is common in dense canopy forests.

Peechi-Vazhani is important for many endemic reptiles of the Western Ghats. Bhupathy & Choudhary (1995) have recorded the Travancore Tortoise *Indotestudo forstenii*. Thomas & Easa (1997) recorded 31 species of reptiles from Peechi area. Of these, the Travancore Tortoise and Elliot's Forest Lizard *Calotes elliotti* are endemic to the Western Ghats.

VULNERABLE	
Asian Woollyneck	*Ciconia episcopus*
Indian Broad-tailed Grass-warbler	*Schoenicola platyurus*
NEAR THREATENED	
Oriental Darter	*Anhinga melanogaster*
Lesser Fish-eagle	*Ichthyophaga humilis*
River Tern	*Sterna aurantia*
Great Pied Hornbill	*Buceros bicornis*
Grey-headed Bulbul	*Microtarsus priocephalus*
Nilgiri Flycatcher	*Eumyias albicaudatus*
ENDEMIC BIRD AREA 123: WESTERN GHATS	
Grey-fronted Green-pigeon	*Treron affinis*
Malabar Grey Hornbill	*Ocyceros griseus*
Malabar Barbet	*Psilopogon malabaricus*
Malabar Parakeet	*Psittacula columboides*
Malabar Woodshrike	*Tephrodornis sylvicola*
White-bellied Treepie	*Dendrocitta leucogastra*
Grey-headed Bulbul	*Microtarsus priocephalus*
Flame-throated Bulbul	*Pycnonotus gularis*
India Rufous Babbler	*Turdoides subrufa*
Malabar Starling	*Sturnia blythii*
Nilgiri Thrush	*Zoothera neilgherriensis*
White-bellied Blue Flycatcher	*Cyornis pallipes*
Nilgiri Flycatcher	*Eumyias albicaudatus*
Nilgiri Flowerpecker	*Dicaeum concolor*
Small Sunbird	*Leptocoma minima*
BIOME 10: INDIAN PENINSULA TROPICAL MOIST FOREST	
Blue-faced Malkoha	*Phaenicophaeus viridirostris*
Jerdon's Nightjar	*Caprimulgus atripennis*
Indian Swiftlet	*Aerodramus unicolor*
Malabar Trogon	*Harpactes fasciatus*
White-cheeked Barbet	*Megalaima viridis*
Malabar Barbet	*Psilopogon malabaricus*
Yellow-browed Bulbul	*Acritillas indica*
Dark-fronted Babbler	*Rhopocichla atriceps*
Indian Scimitar-babbler	*Pomatorhinus horsfieldii*
Malabar Whistling-thrush	*Myophonus horsfieldii*
Loten's Sunbird	*Cinnyris lotenius*

LAND USE

- Nature conservation and research
- Forestry

THREATS AND CONSERVATION ISSUES

- Grazing
- Firewood collection

Cattle grazing is a major problem. Goats, cows, and buffaloes are raised by villagers, which are very destructive to the natural regeneration process. Fires are common during summer, generally lit by villagers to get new growth in the pastures. The State Fisheries Department, for the purpose of enhancing inland fish production, has introduced many exotic fish species in many reservoirs of Kerala,

PO. NAMEER

Two dams present within this sancutary provides habitat for some waterfowl in this otherwise forested IBA. A total of 228 bird species have been described till now

including Peechi and Vazhani. These reservoirs are being regularly stocked with Indian major carps, such as Catla, Rohu, and Mrigal. The impact of these exotic fish being introduced into the reservoirs on the native biota is substantial. These carps are not relished by the local people, so their introduction does not help to ensure food security or livelihoods. Many native species which these major carps compete with (e.g., Tor/Mahseer, other large barbs of the genus *Hypselobarbus*, native catfishes) draw a higher market price and are much more in demand.

Before the declaration of the sanctuary, harvesting of timber and bamboo was allowed. These operations have stopped, except for thinning of teak plantations.

Peechi Lake and Vazhani Lake attract lots of tourists, mainly for picnics. They can be regulated and imparted conservation knowledge through interpretation centres and good take-away literature. This IBA is also an excellent area for long-term research on the endemic flora and fauna of the Western Ghats.

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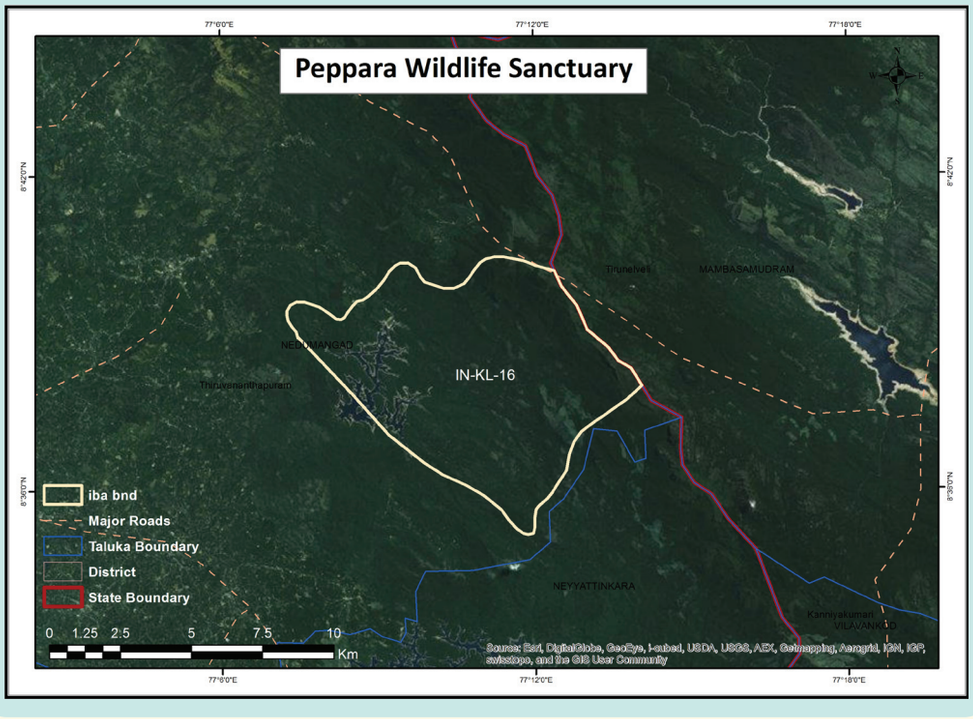
PEPPARA WILDLIFE SANCTUARY

IN-KL-16

IBA Site	: IN-KL-16	**Rainfall**	: 3,200 mm
Administrative Region (State)	: Kerala	**Temperature**	: 16 ºC to 35 ºC
District	: Trivandrum	**Biogeographic Zone**	: Western Ghats
Coordinates	: 8º 46' 01" N,	**Habitats**	: Tropical Wet Evergreen Forest, Tropical Semi-evergreen Forest, Tropical Moist Deciduous Forest, Tropical Grassland, Montane Evergreen (Shola), Ochlandra beds
	77º 08' 53" E		
Ownership	: State		
Area	: 5,300 ha		
Altitude	: 90–1,717 msl		

IBA CRITERIA: A1 (Threatened species), A2 (Endemic Bird Area 123: Western Ghats), A3 (Biome 10: Indian Peninsula Tropical Moist Forest)

PROTECTION STATUS: Wildlife Sanctuary, established December, 1983.



GENERAL DESCRIPTION

Peppara Wildlife Sanctuary is part of the Agasthyamalai forests in Thiruvananthapuram district. It is bordered on the northeast by Kalakkad-Mundanthurai Tiger Reserve (an IBA) in Tamil Nadu, on the north by Palode Reserve Forest, to the south by Neyyar Wildlife Sanctuary (an IBA), and to the southwest by Agasthyavanam Biological Park. The topography is rugged, with flat meadows and gentle to steep slopes. River Karamana, on which a dam has been constructed, resulting in a 5.82 sq. km reservoir, drains the forest. A rock formation called Para Appu is a remarkable feature of these hills. The sanctuary is well known for its excellent scenic beauty, cool climate, and luxuriant vegetation. It has West Coast Tropical Evergreen and Semi-evergreen, Southern Moist Deciduous, Southern Tropical Hill, and Southern Hilltop Evergreen Forests (Champion & Seth 1968). Reedbeds and *Myristica* swamps are also found. West Coast Tropical Evergreen Forest is seen in comparatively small parts in the Palode area. The trees are as tall at 30 m, while the undergrowth is a mixture of canes, palms, and ferns. Between 150 and 1,000 m, on the hill slopes, West Coast Semi-evergreen Forest is seen, with Bamboo *Bambusa arundinacea*. The trees are covered with epiphytes and climbers. About 60% of the sanctuary area is covered with Southern Moist Mixed Deciduous Forest. Southern Hilltop Tropical Evergreen Forest (shola) is

found above 1,000 m on top of the hills, exposed to heavy wind. Such forest can be seen in Manochola, Kovilthery, Athirumala, and Chemmuji areas of this IBA.

Peppara is one of the seven Medicinal Plant Conservation Areas in Kerala. Arogyapacha *Trichopus zeylanicus*, a medicinal herb, is found in this sanctuary in abundance.

AVIFAUNA

A bird survey in December 2010 recorded 142 species from five different sites (Nameer *et al.* 2011). The globally Threatened White-bellied Blue-Robin *Myiomela albiventris* was seen at this site (Robin 2001). Based on taxonomic changes (Rasmussen and Anderton 2012), 26 species are endemic to the Western Ghats. In Peppara, 19 of these endemics are found, including the globally Threatened Nilgiri Wood-pigeon *Columba elphinstonii* and Indian Broad-tailed Grass-warbler *Schoenicola platyurus*. The higher reaches of the IBA, such as Pandipath, have excellent populations of the *meridionale* race of Kerala Laughingthrush *Strophocincla fairbanki* (Chandran & Praveen 2013). Rasmussen and Anderton (2005) consider it as a full species and term it *Trochalopteron fairbanki*. Nameer and Praveen (2012) have termed it Travancore Laughingthrush *Strophocincla meridionale*.

This site has been selected as an IBA as it qualifies on the basis of three criteria: A1 (Threatened species), A2 (Restricted-Range or endemic species), and A3 (Biome-restricted assemblages).

OTHER KEY FAUNA

Peppara has a rich variety of endemic and rare fauna, such as the Lion-tailed Macaque *Macaca silenus*, Nilgiri Langur *Trachypithecus johni*, Nilgiri Tahr *Hemitragus hylocrius*, and Nilgiri Marten *Martes gwatkinsi* (Christopher & Jayson 1996). Asiatic Elephant *Elephas maximus*, Gaur *Bos gaurus*, Sambar *Rusa unicolor*, Barking Deer *Muntiacus muntjak*, Mouse Deer *Moschiola indica*, Sloth Bear *Melursus ursinus*, Dhole or Wild Dog *Cuon alpinus*, and Indian Giant Squirrel *Ratufa indica* are other important terrestrial mammals of Peppara.

ENDANGERED	
White-bellied Blue Robin	*Myiomela albiventris*
VULNERABLE	
Nilgiri Wood-pigeon	*Columba elphinstonii*
Indian Broad-tailed Grass-warbler	*Schoenicola platyurus*
NEAR THREATENED	
Lesser Fish-eagle	*Ichthyophaga humilis*
Oriental Darter	*Anhinga melanogaster*
Great Pied Hornbill	*Buceros bicornis*
Grey-headed Bulbul	*Pycnonotus priocephalus*
Travancore Laughingthrush	*Strophocincla meridionale*
Nilgiri Flycatcher	*Eumyias albicaudatus*
Black-and-Orange Flycatcher	*Ficedula nigrorufa*
ENDEMIC BIRD AREAS 123: WESTERN GHATS	
Nilgiri Wood-pigeon	*Columba elphinstonii*
Grey-fronted Green-pigeon	*Treron affinis*
Malabar Parakeet	*Psittacula columboides*
Malabar Grey Hornbill	*Ocyceros griseus*
Malabar Barbet	*Psilopogon malabaricus*
Grey-headed Bulbul	*Pycnonotus priocephalus*
Flame-throated Bulbul	*Pycnonotus gularis*
Indian Broad-tailed Grass-warbler	*Schoenicola platyurus*
Indian Rufous Babbler	*Turdoides subrufa*
Travancore Laughingthrush	*Strophocincla meridionale*
Malabar Starling	*Sturnia blythii*
Nilgiri Thrush	*Zoothera neilgherriensis*
White-bellied Blue Robin	*Myiomela albiventris*
Black-and-Orange Flycatcher	*Ficedula nigrorufa*
Nilgiri Flycatcher	*Eumyias albicaudatus*
White-bellied Blue Flycatcher	*Cyornis pallipes*
Nilgiri Flowerpecker	*Dicaeum concolor*
Small Sunbird	*Leptocoma minima*
White-bellied Treepie	*Dendrocitta leucogastra*
BIOME 10: INDIAN PENINSULA TROPICAL MOIST FOREST	
Jerdon's Nightjar	*Caprimulgus atripennis*
Indian Swiftlet	*Aerodramus unicolor*
Malabar Trogon	*Harpactes fasciatus*
White-cheeked Barbet	*Megalaima viridis*
Malabar Barbet	*Psilopogon malabaricus*
Yellow-browed Bulbul	*Iole indica*
Indian Scimitar-babbler	*Pomatorhinus horsfieldii*
Dark-fronted Babbler	*Rhopocichla atriceps*
Malabar Whistling-thrush	*Myophonus horsfieldii*
Loten's Sunbird	*Cinnyris lotenius*

LAND USE

- Agriculture
- Aquaculture and fisheries
- Tourism and recreation
- Nature conservation and research

THREATS AND CONSERVATION ISSUES

- Grazing
- Tourism and recreation
- Collection of Non-Timber Forest Produce

In Peppara, there are 13 settlements of Kani tribals, scattered in the buffer zone as well as in the core area (Christopher *et al.* 1994). Their main source of income is agriculture, supplemented by gathering of non-timber forest products (NTFP). They are known for their knowledge of traditional medicine and their expertise in making articles from reeds and rattan. The Kanis were also famous for their adventurous honey collection expeditions on highly rugged rock cliffs and treetops (Thurston 1909). Christopher & Jayson (1996) record that the open auction of NTFP collected by Kani tribals from Peppara greatly benefited them. But now, non-tribals living around the sanctuary compete with

MRUGANK PRABHU

Duttaphrynus beddomii (Gunther, 1875) is endangered species of toad found in Peppara WLS in Kerala, Kalakad Mundunthurai Tiger Reserve in Tamil Nadu

the Kanis for the collection, especially of reeds and rattan. If the area is managed as a wildlife sanctuary, the tribals could get sustained yields of NTFP, and because of their centralized auction market, they would get good remuneration for their products, giving them a stake in the protection of this area. There is a great opportunity to integrate the local tribals into the management of the sanctuary, especially as they have such vast and valuable knowledge of the forest. At the same time, in order to reduce their dependence on the forest, there is a proposal to relocate them outside the sanctuary in the failed plantations of the Kerala Forest Development Corporation Ltd. at Chathankodu.

During the Agasthyamalai pilgrimage season, several routes inside the sanctuary are used by the pilgrims to reach the summit, and the final trek path runs along the park boundary. This is a major concern for the high-altitude biota. Peppara is easily accessible, only 50 km from Thiruvananthapuram city, and it can become a major tourist destination, but extreme care should be taken to avoid overburdening the ecosystem.

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E.A. Jayson, Praveen J.

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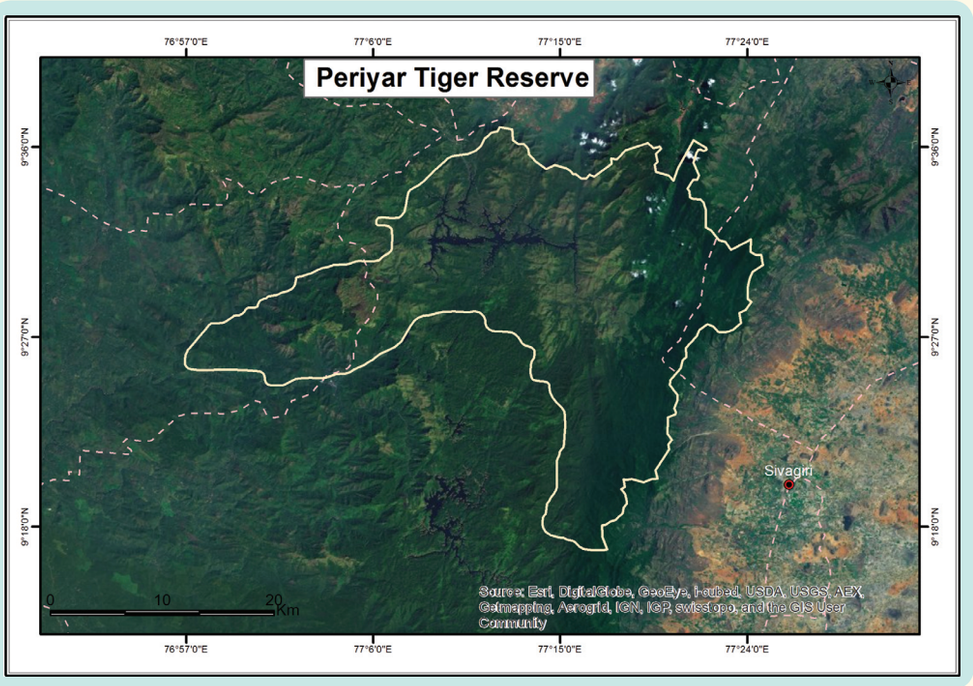
PERIYAR TIGER RESERVE

IBA Site	:	IN-KL-17	**Altitude**	:	150–2,019 msl
Administrative Region (State)	:	Kerala	**Rainfall**	:	2,500 mm
District	:	Idukki	**Temperature**	:	10 ºC to 31 ºC
Coordinates	:	9º 17' 56"to 9º 37' 10.2" N, 76º 56' 12.12" to 77º 25' 5" E	**Biogeographic Zone**	:	Western Ghats
Ownership	:	State	**Habitats**	:	Tropical Wet Evergreen Forest Tropical semi-evergreen forest, Moist deciduous forest, grassland and wetland
Area	:	92,500 ha			

IBA CRITERIA: A1 (Threatened Species), A2 (Endemic Bird Area 123: Western Ghats), A3 (Biome 10: Indian Peninsula Tropical Moist Forest)

PROTECTION STATUS: Wildlife Sanctuary, established August, 1950. Tiger Reserve established 1978. Declared a National Park in 1982



GENERAL DESCRIPTION

Periyar Tiger Reserve (PTR) is one of the most famous tiger reserves of India. It has an area of 925 sq. km, including Periyar Lake (2,600 ha). The boundaries are adjacent to Madurai and Ramanadhapuram districts to the east, Kottayam district to the west, and Pathanamthitta district to the south. It was one of the first Project Tiger areas of the country.

This IBA lies among undulating landscape with hills and forested valleys that stretch across a section of the Western Ghats. It falls steeply to populated lowlands on all sides, except along the northwest boundary flanking the more cultivated parts of the Cardamom Hills, and in the northeast and southeast corners where narrow corridors link it with the High Wavy Mountains and Panthalam range, respectively. The northern and eastern boundary of the reserve follows the Kerala-Tamil Nadu border along the crest line of Western Ghats for *c.* 90 km.

In 2007, the core or critical tiger habitat of PTR was notified, with an area of 881 sq. km which includes Periyar Wildlife Sanctuary Proper (733 sq. km) and Reserve Forests (148 sq. km) in the adjoining Goodrickal Range of Ranni Division. The core of the tiger reserve is 881 sq. km, the tourism zone 10 sq. km, and the buffer zone 44 sq. km, that includes the Sabarimala pilgrim management zone.

The lowest elevation in PTR is 150 m along River Pambiyar in the Kerala foothills, but this is not typical as most of the reserve lies between 750 and 1,500 m. Periyar Lake spreads between the uneven terrain with many bays, islands, and long creeks winding up the valleys. Most of

ENDANGERED	
White-bellied Blue-Robin	*Myiomela albiventris*
VULNERABLE	
Greater Spotted Eagle	*Clanga clanga*
Asian Woollyneck	*Ciconia episcopus*
Nilgiri Wood-pigeon	*Columba elphinstoni*
Indian Broad-tailed Grass-warbler	*Schoenicola platyura*
NEAR THREATENED	
Spot-billed Pelican	*Pelecanus philippensis*
Oriental Darter	*Anhinga melanogaster*
Painted Stork	*Mycteria leucocephala*
Lesser Fish-eagle	*Ichthyophaga humilis*
Pallid Harrier	*Circus macrourus*
River Tern	*Sterna aurantia*
Malabar Pied Hornbill	*Anthracoceros coronatus*
Great Pied Hornbill	*Buceros bicornis*
Grey-headed Bulbul	*Pycnonotus priocephalus*
Kerala Laughingthrush	*Strophocincla fairbanki*
Tytler's Leaf-warbler	*Phylloscopus tytleri*
Black-and-Orange Flycatcher	*Ficedula nigrorufa*
Nilgiri Flycatcher	*Eumyias albicaudatus*
ENDEMIC BIRD AREA 123: WESTERN GHATS	
Nilgiri Wood-pigeon	*Columba elphinstoni*
Malabar Parakeet	*Psittacula columboides*
Malabar Grey Hornbill	*Ocyceros griseus*
Grey-headed Bulbul	*Pycnonotus priocephalus*
White-bellied Blue Robin	*Myiomela albiventris*
Wynaad Laughingthrush	*Dryonastes delesserti*
Kerala Laughingthrush	*Strophocincla fairbanki*
Indian Rufous Babbler	*Turdoides subrufus*
Indian Broad-tailed Grass-warbler	*Schoenicola platyurus*
Black-and-orange Flycatcher	*Ficedula nigrorufa*
Nilgiri Flycatcher	*Eumyias albicaudatus*
White-bellied Blue Flycatcher	*Cyornis pallipes*
Small Sunbird	*Leptocoma minima*
White-bellied Treepie	*Dendrocitta leucogastra*
BIOME 10:INDIAN PENINSULA TROPICAL MOIST FOREST	
Blue-faced Malkoha	*Phaenicophaeus viridirostris*
Sri Lanka Frogmouth	*Batrachostomus moniliger*
Jerdon's Nightjar	*Caprimulgus atripennis*
Indian Swiftlet	*Collocalia unicolor*
Malabar Trogon	*Harpactes fasciatus*
Malabar Pied Hornbill	*Anthracoceros coronatus*
White-cheeked Barbet	*Megalaima viridis*
Malabar Barbet	*Megalaima malabarica*
Hill Swallow	*Hirundo domicola*
Yellow-browed Bulbul	*Iole indica*
Malabar Whistling-thrush	*Myophonus horsfieldii*
Dark-fronted Babbler	*Rhopocichla atriceps*
Indian Scimitar-babbler	*Pomatorhinus horsfieldii*
Loten's Sunbird	*Cinnyris lotenius*
Black-throated Munia	*Lonchura kelaarti*

the land was not cleared before being flooded, and the bare, gaunt skeletons of long-dead forest hardwood still stand in the water. The maximum depth of the lake is 42 m, and the shoreline is generally steep.

The vegetation of this IBA is mainly composed of Tropical Evergreen Forest and Semi-evergreen Forest. In the central part of the Reserve, Moist Deciduous Forest and grasslands predominate. Reed beds are primarily located in the evergreen and semi-evergreen forests (Chandrasekhran 1973). There is *Eucalyptus* plantation in the western part of the buffer zone.

Among the 1,272 plant species that are considered endemic to the southern Western Ghats, 515 species were collected from PTR (Sasidharan 1998). A new species of orchid *Habenaria periyarensis*, and a new tree species *Syzygium periyarensis*, have been described from here. This shows the importance of PTR as a biodiversity hotspot.

AVIFAUNA

This IBA is one of the most visited places in southern India. Birdwatchers come to see the Western Ghats endemics and forest birds. Despite the presence of a large artificial lake, aquatic birdlife is rather poor, apparently due to deep water of the lake. Robertson & Jackson (1992) have identified 315 species of birds in PTR.

Historically, Critically Endangered vultures have been reported from this area, but are now considered locally extinct.

According to Stattersfield *et al*. (1998), this IBA lies in the Western Ghats Endemic Bird Area (EBA 123). Based on the latest taxonomy (Rasmussen & Anderton 2005, 2012; del Hoyo & Collar 2014), 26 birds have been listed as endemic to the Western Ghats out of which 14 species are reported till now.

BirdLife International (undated) has classified species based on biome assemblages. Accordingly, this site lies in Biome 10 (Indian Peninsula Tropical Moist Forest), where 15 representative species have been identified, and all of them are recorded from this site, which is also a sort of record. In very few sites were we able to record all 15 Biome 10 species.

PTR is also an important wintering site for many long-distance migrants such as Tickell's Leaf-warbler *Phylloscopus affinis*, Large-billed Leaf-warbler *Phylloscopus magnirostris*, Large-crowned Leaf-warbler *Phylloscopus occipitalis*, Rufous-tailed Flycatcher *Muscicapa ruficauda*, Pied Thrush Zoothera wardii, and others.

PTR is one of the few sites where the occurrence of the Wood Snipe *Gallinago nemoricola* has been confirmed. However, some recent publications do not treat these records as confirmed (Sashikumar *et al*. 2011a). In India, the Wood Snipe breeds in the Himalaya and winters in southern India. Its population has drastically declined, apparently due to habitat loss in the breeding areas, and hunting in wintering areas (BirdLife International 2014). Nilgiri Pipit *Anthus nilghiriensis* has also been reported from this IBA, however its status in the entire Western Ghats needs re-examination after recent

studies failed to locate it in most sites where it was reported in the past (Robin *et al.* 2014).

Asian Woollyneck *Ciconia episcopus*, recently uplisted to Vulnerable, is known to be nesting in the reserve for several decades.

OTHER KEY FAUNA

Periyar is renowned for its herds of wild Asiatic Elephant *Elephas maximus*, seen on the edge of Periyar Lake. Tiger *Panthera tigris* is not uncommon. Periyar has perhaps the best representative forests where most of the southern Western Ghats endemic and rare mammal species are found, such as the Lion-tailed Macaque *Macaca silenus*, Nilgiri Langur *Trachypithecus johni*, and Travancore Flying Squirrel *Petinomys fuscocapillus* (Ramachandran *et al.* 1986). Wild Dogs *Cuon alpinus*, uncommon in other forests, are regularly seen in Periyar, chiefly around the lake where their main prey such as Sambar *Rusa unicolor*, Barking Deer *Muntiacus muntjak*, Mouse Deer *Moschiola meminna*, and Wild Boar *Sus scrofa* concentrate. Indian Giant Squirrel *Ratufa indica* and Gaur *Bos gaurus* are very common in this sanctuary.

Although PTR is globally renowned for its large mammal diversity, and particularly its tiger conservation efforts, the reserve also harbours an exceptionally high diversity (57 species) of endemic (25 endemic to Western Ghats, seven endemic to PTR) and threatened (14 species) freshwater fishes, unmatched anywhere in South Asia (Zacharias *et al.* 1996 Rajeev Raghavan, *pers. comm.* 2014). PTR thus qualifies as a unique hotspot for endemic freshwater fish not only in the Western Ghats but also in the South Asian region. The broad catchment area feeding Periyar Lake, with several primary and secondary streams, is the last home for one genus, *Lepidopygopsis*, and eight species of freshwater fish (Dahanukar *et al.* 2011). Three of these eight endemic fish species are categorized as Endangered, thus meeting the Alliance for Zero Extinction (AZE) criteria, and qualifying PTR as an AZE site, which deserves high conservation priorities.

Some of the endemic frogs newly described from PTR include *Nyctibatrachus gavi* and *N. periyar* (Jafer Palot, *pers. comm.* 2014). Butterfly (Palot *et al.* 1997) and reptile (Zacharias 1997) fauna is also very diverse in Periyar Tiger Reserve.

LAND USE

- Nature conservation and research
- Ecotourism
- Pilgrimage

THREATS AND CONSERVATION ISSUES

- Pilgrimage
- Grazing
- Collection of fuel wood and other forest products
- Tourism and recreation
- Human habitation

DHRITIMAN MUKHERJEE

Periyar Tiger Reserve was one of the first 9 Project Tiger areas of India. It has an area of 925 sq. km. including the famous Periyar Lake 2,600 ha

Some temporary human encroachment is found inside PTR, but on the whole the forest inside the reserve is well-protected. However, the reserve is surrounded by human habitations. Within walking distance of Kumili, Idukki district, the forest is under considerable pressure from wood-cutting, and grass patches are heavily grazed by cattle. Permanent cultivation reaches the edge of the reserve in many areas. On the lower southwestern slopes, there are rubber plantations and tea estates, while scattered coffee and spice plantations dominate the higher plateau around Vandiperiyar and Peermade. The steep slope below Kumili is clothed in increasingly disturbed deciduous woodland, ending abruptly in the agricultural fields of Cumbum Valley. Cardamon estates surround the forested boundary to the northeast and east, where the equally steep and much higher flanks support even more extensive evergreen and moist deciduous forest, with a narrow strip of reserve forest along the base of the hills.

Elephant poaching is a major menace in PTR. There are very few tuskers left, and the remaining ones have to be constantly protected. Higher altitude regions on the state border are under constant threat from poachers who enter easily from the neighbouring tea estates in Tamil Nadu.

The presence of Sabarimala temple inside the tiger reserve has been a constant threat – the small zone earmarked for the pilgrimage is unable to withstand the yearly influx of devotees, creating incessant pressure on the neighbouring forest zones. There is constant pressure to create new access routes through the core zone for pilgrims.

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The IBA Team, Praveen J, P.O. Nameer.

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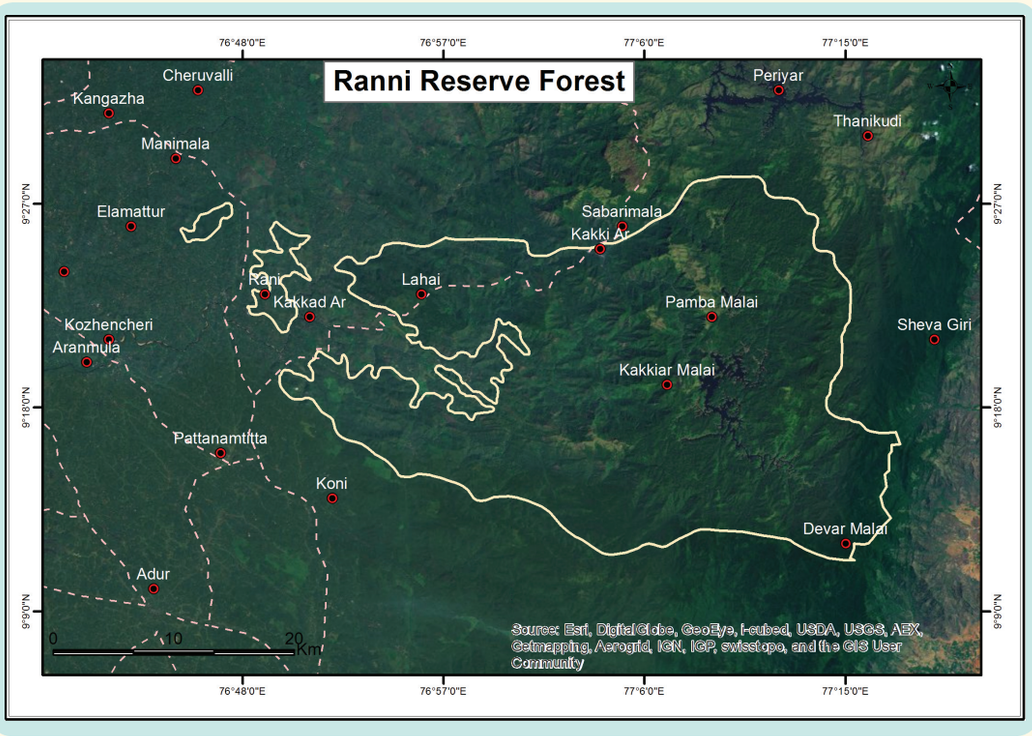
RANNI RESERVE FOREST

IBA Site code	: IN-KL-18	**Rainfall**	: 2,540–4,064 mm
Administrative Region (State)	: Kerala	**Temperature**	: 16 ºC to 35 ºC
District	: Kollam	**Biogeographic Zone**	: Western Ghats
Coordinates	: 9º 18' 30" N, 76º 58' 30" E	**Habitats**	: Tropical Evergreen Forest, Tropical Semi-evergreen Forest, Tropical Moist Deciduous Forest, Tropical Hill Savannah
Ownership	: State		
Area	: 87,738 ha		
Altitude	: 46–1,300 msl		

IBA CRITERIA: A1 (Threatened species), A2 (Endemic Bird Area 123: Western Ghats), A3 (Biome 10: Indian Peninsula Tropical Moist Forest)

PROTECTION STATUS: Not officially protected.



GENERAL DESCRIPTION

Ranni Reserve Forest covers the whole of Goodrickal, Rajampara, Karikulam, Shethakkal, Shethakkal Extension, and Valiacavu Proposed Reserve. The major reserves (namely Konni, Rajampara and Goodrical) lie in a compact block adjacent to each other. The IBA includes two major forest ranges in Ranni Reserve Forest – Ranni Forest Range (136 sq. km) and Vadasserikkara Forest Range (269 sq. km).

Ranni Reserve Forest is mostly covered with Southern Tropical Evergreen, Southern Moist Deciduous, and Tropical Semi-evergreen forests. Evergreen forest is generally found along the river banks and streams, and in areas below 1,000 m. Tropical Moist Deciduous Forest is present in most parts of Ranni RF below 800 m. Annual fires result in the spread of grass in the more open areas. The hilltops are covered with grassland, especially in Murinjakaru, Nanattupara, and Kattadikunnu areas. The whole area is very rugged. The Working Plan document (Pillai, undated) mentions 165 species of plants, mainly of commercial importance.

Ranni RF has been selected as an IBA because this almost compact 400 sq. km block, adjacent to Periyar Tiger Reserve, has good natural forests of the Western Ghats.

AVIFAUNA

No comprehensive inventory of the avifauna of Ranni Reserve Forest has been made. However, Sálim Ali spent six days at Rajampara during the Travancore-Cochin survey of 1933 and recorded 80 species (Ali & Whistler 1935–37).

IN-KL-18

DHRITIMAN MUKHERJEE

Malabar Pied Hornbill *Anthracoceros coronatus* has been reported from Ranni Reserve Forest but needs further confirmation

VULNERABLE	
Nilgiri Wood-pigeon	*Columba elphinstonii*
Indian Broad-tailed Grass-warbler	*Schoenicola platyurus*
NEAR THREATENED	
Lesser Fish-eagle	*Ichthyophaga humilis*
Malabar Pied Hornbill	*Anthracoceros coronatus*
Great Pied Hornbill	*Buceros bicornis*
Grey-headed Bulbul	*Pycnonotus priocephalus*
ENDEMIC BIRD AREA 123: WESTERN GHATS	
Nilgiri Wood--igeon	*Columba elphinstoni*
Malabar Parakeet	*Psittacula columboides*
Malabar Grey Hornbill	*Ocyceros griseus*
Grey-headed Bulbul	*Pycnonotus priocephalus*
Indian Rufous Babbler	*Turdoides subrufus*
White-bellied Blue Flycatcher	*Cyornis pallipes*
Small Sunbird	*Leptocoma minima*
White-bellied Treepie	*Dendrocitta leucogastra*

In a repeat survey, Sashikumar *et al.* (2011) covered large parts of Ranni RF for the same duration and recorded 118 species. These forests harbour an excellent population of Great Pied Hornbill *Buceros bicornis*. Malabar Pied Hornbill *Anthracoceros coronatus* has been reported from Ranni forests, but confirmation is lacking (Sashikumar *et al.* 2011). The presence of two dams increased the number of wetland dependent species seen during the repeat survey. Rare and endemic to south India and Sri Lanka, the Legge's Hawk-Eagle *Spizaetus nipalensis kelaarti* is seen often in these forests. As information on avifauna is scant, more surveys are required by experts.

OTHER KEY FAUNA

Data not available.

LAND USE

- Forestry
- Ecotourism
- Pilgrimage
- Hydel projects

THREATS AND CONSERVATION ISSUES

- Encroachments
- Grazing
- Pressure due to Sabarimala pilgrimage

KEY CONTRIBUTORS

State Coordinator and IBA Team, Harikumar Mannar, Praveen J.

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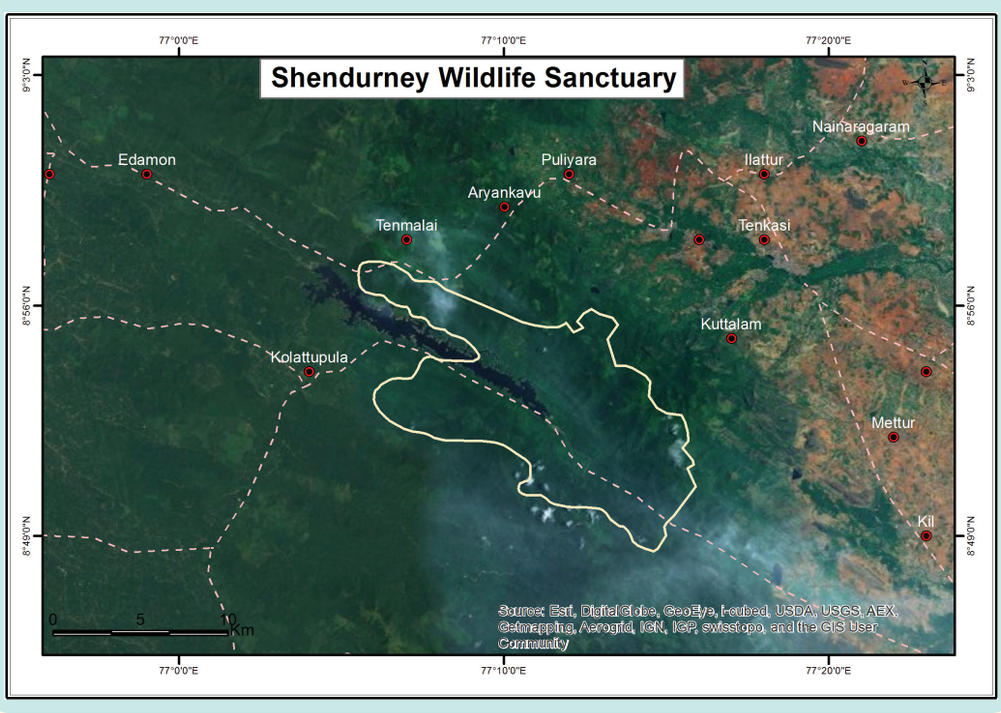
SHENDURNEY WILDLIFE SANCTUARY

IBA Site	: IN-KL-19	**Rainfall**	: 3,000–3,200 mm
Administrative Region (State)	: Kerala	**Temperature**	: 16 ºC to 33 ºC
District	: Kollam	**Biogeographic Zone**	: Western Ghats
Coordinates	: 08º 44' to 9 º14 N, 76º 59' to 77º 16' E	**Habitats**	: West Coast Tropical Evergreen Forest, West Coast Tropical Semi-evergreen Forest, Southern Hilltop Tropical Evergreen Forest, Southern Subtropical Hill Forest, Southern Secondary Moist Mixed Deciduous Forest, Ochlandra beds, Myristica Swamp Forest, Grasslands
Ownership	: State		
Area	: 166.72 sq. km		
Altitude	: 100–1,550 msl		

IBA CRITERIA: A1 (Threatened species), A2 (Endemic Bird Area 123: Western Ghats), A3 (Biome 10: Indian Peninsula Tropical Moist Forest)

PROTECTION STATUS: Wildlife Sanctuary, established August 25, 1984.



GENERAL DESCRIPTION

Shendurney Wildlife Sanctuary is located on the northern aspect of Agasthyamalai Hills of the southern Western Ghats. The region lies in the drainage and catchment area of Parappar Dam (Thenmalai), constructed across Chendurney-Kulathupuzha rivers that are tributaries of river Kallada. The sanctuary derives its name from the Chenkurunji tree *Gluta travancorica* found here. The Achenkovil Gap separates this region from the Periyar sub-cluster in the north. The southern boundary lies along the border of the Thiruvananthapuram Forest Division and Thenmalai Division lies on the west, while the north-western border is shared with Punalur division. The eastern border is demarcated by the state boundary of Kerala and Tamil Nadu. Shendurney is separated from Peppara Wildlife Sanctuary to its south by a narrow stretch of reserve forest in Kulathupuzha and Palode (Anon. 2013) .

Before the advent of the British in India, the entire region was covered with thick evergreen forests of great timber value. British planters, who took possession of large tracts ostensibly for coffee and tea cultivation, ruthlessly destroyed these forests for timber. Most of the areas have since been reclaimed and brought under forest cover. There is no tribal settlement inside the sanctuary. However, there are private

estates and revenue enclosures inside the sanctuary.

Shendurney IBA bears most of the forest types found in the southern Western Ghats. It has West Coast Tropical Evergreen Forest, West Coast Tropical Semi-evergreen Forest, Southern Hilltop Tropical Evergreen Forest, Southern Subtropical Hill Forest, Southern Secondary Moist Mixed Deciduous Forest, Ochlandra Reed beds, Myristica Swamp Forest, and Grasslands (Anon. 2013)

The West Coast Tropical Evergreen Forest is mostly found in the southeastern part of the sanctuary in Umayar, Dharbhakulam, Pattakulam, Kallar, and Rockwood areas. The trees are often 50 m high, and the undergrowth is a mixture of canes, palms, and ferns. The West Coast Semi-evergreen vegetation generally adjoins the evergreen belt and grows on the banks of the main rivers and streams. In the Southern Moist Mixed Deciduous, Teak *Tectona grandis* is present occasionally and may be an indicator of secondary succession (Anon. 2013). Above 1,000 m, stunted Evergeen Forest (Shola), typical of the Western Ghats, abound. The tree height is generally 10–15 m. *Mesua*, *Hopea*, *Calophyllum*, *Cullenia*, *Syzygium*, *Cinnamomum*, *Calamus*, and *Strobilanthus* spp. are common. This type of forest occurs in the Pandimotta area and on the eastern ridges. Reedbeds of *Ochlandra travancorica* are extremely common, and in certain parts they completely replace the Shola forests (Chandra & Praveen 2013).

DHRITIMAN MUKHERJEE

IBAs are now known as Important Bird and Biodiversity areas. They are also key biodiversity areas as they harbour many taxonomic groups, for example Shendurney Wildlife Sanctuary, an IBA has a large population of Gaur *Bos gaurus*

Shendurney is important for the survival of endemic plants of the Western Ghats. In a study by Sasidharan (1997), out of the estimated 1,272 endemic species of the Western Ghats, 460 are threatened under various threat categories. This site bears 100 threatened species, including 10 that had been considered extinct. Two species new to science, *Polyalthia shendurunii* and *Ardisia stonei* were described from the sanctuary.

AVIFAUNA

Ahmed (1996) observed 84 species, while on bird surveys organized by the NGO Warblers and Waders Susanthkumar (1997) reported 204 species. The Kerala Forest Department also organized bird surveys through NGOs and birdwatchers, from 1995 to 2000, involving 36 participants, during which a combined checklist of 245 species was prepared (Anon. 2000). In January 2014, a bird survey conducted by Travancore Natural History Society (TNHS) recorded 156 species of birds in three days, which included 14 endemics to the Western Ghats (Kalesh *et al*. 2014). The survey covered various altitude and vegetation gradients of the sanctuary and the bird diversity and density were assessed. According to their report, the total number of bird species in the sanctuary is 226 (Kalesh *et al*. 2014).

Almost all the Western Ghats endemics were seen in this IBA. The population of the Vulnerable Nilgiri Wood-pigeon *Columba elphinstonii* appears to be high, especially in the high-elevation region of Pandimotta. Nesting colonies of River Tern *Sterna aurantia* and Small Pratincole *Glareola lactea* were found along the reservoir. There was a suspicion that these two species are becoming uncommon, mainly due to disturbance in their breeding grounds. However, water bird survey in January 2012 recorded an increase in the total number of birds and no significant disturbance was observed inside the sanctuary (Kalesh *et al*. 2012a, Kalesh

et al. 2014). Though the Nilgiri Pipit has been recorded from this IBA, Robin *et al.* (2014) argue that these records could be misidentifications, and confirmation is desirable.

The taxonomy of the *Strophocinla* laughingthrushes of the Western Ghats is disputed. Nameer and Praveen (2012, Praveen and Nameer 2012) have identified four species in the Western Ghats, and Travancore Laughingthrush *Strophocinla meridionle* is found in this IBA. Ali and Ripley (1987) have named it as Kerala Laughingthrush *Strophocincla fairbanki meridionalis*, and Rasmussen and Anderton (2005) consider it as full species but has included it in another genus *Tracholopteron* and termed it Kerala Laughingthrush *Tracholopteron fairbanki*. It is endemic south of the Achenkovil Gap, occurs in Pandimotta (Chandran & Praveen 2013) and is proposed as a distinct, possibly Endangered species (Praveen & Nameer 2012).

Shendurney WLS is located in the Western Ghats Endemic Bird Area (EBA 123). In this EBA, 26 species are listed as endemic or restricted-range. Fourteen species, including two Near Threatened ones, have been found in Shendurney till now. The site is classified under Biome 10 (Indian Peninsula Tropical Moist Forest) by BirdLife International (undated). Eight out of 15 species listed in Biome 10 are found here.

Ali & Whistler (1935–1937), during their Travancore-Cochin survey, recorded 63 species from Tenmala which is at the base of the sanctuary. It is likely that they also visited some parts of the current sanctuary during their survey in 1933. During a repeat survey in 2009, Sashikumar *et al*. (2011a) recorded 146 species and they covered several parts of the sanctuary. The most significant discovery of this survey was the first nesting record of Lesser Fish-eagle *Ichthyophaga humilis* from southern India at Umayar (Sashikumar *et al*. 2011b).

This site serves as an important wintering area for migrants from the Himalaya and further north. Tickell's Leaf-warbler *Phylloscopus affinis*, Western Crowned-warbler *P. occipitalis*, Large-billed Leaf-warbler *Phylloscopus magnirostris*, Rufous-tailed Flycatcher *Muscicapa ruficauda*, Brown-breasted Flycatcher *M. muttui*, and Blue-capped Rock-thrush *Monticola cinclorhynchus* are some of the migrants of temperate and subtropical Himalaya commonly seen here. Till now, 16 out of 59 species of Biome 11 (Indo-Malayan Tropical Dry Zone) have been seen at this site. Most of them are quite common and widespread, so they are categorized as Least Concern by BirdLife International (2001).

OTHER KEY FAUNA

Shendurney IBA has almost all the larger mammalian fauna of the southern Western Ghats, such as the Asiatic Elephant *Elephas maximus*, Gaur *Bos gaurus*, Barking Deer *Muntiacus muntjak*, Tiger *Panthera tigris*, Indian Giant Squirrel *Ratufa indica*, Lion-tailed Macaque *Macaca silenus*, and Slender Loris *Loris tardigradus*.

ENDANGERED	
White-bellied Blue Robin	*Myiomela albiventris*
VULNERABLE	
Nilgiri Wood-pigeon	*Columba elphinstonii*
Indian Broad-tailed Grass-warbler	*Schoenicola platyurus*
NEAR THREATENED	
Oriental Darter	*Anhinga melanogaster*
Lesser Fish-eagle	*Ichthyophaga humilis*
River Tern	*Sterna aurantia*
Great Pied Hornbill	*Buceros bicornis*
Black-and-Orange Flycatcher	*Ficedula nigrorufa*
Nilgiri Flycatcher	*Eumyias albicaudatus*
Travancore Laughingthrush	*Strophocincla meridionale*
Grey-headed Bulbul	*Pycnonotus priocephalus*
ENDEMIC BIRD AREA 123: WESTERN GHATS	
Nilgiri Wood-pigeon	*Columba elphinstonii*
Malabar Parakeet	*Psittacula columboides*
Malabar Grey Hornbill	*Ocyceros griseus*
White-bellied Blue Robin	*Myiomela albiventris*
Grey-headed Bulbul	*Pycnonotus priocephalus*
Indian Rufous Babbler	*Turdoides subrufa*
Wynaad Laughingthrush	*Dryonastes delesserti*
Travancore Laughingthrush	*Strophocincla meridionale*
Black-and-Orange Flycatcher	*Ficedula nigrorufa*
Nilgiri Flycatcher	*Eumyias albicaudatus*
White-bellied Blue Flycatcher	*Cyornis pallipes*
Indian Broad-tailed Grass-warbler	*Schoenicola platyurus*
Small Sunbird	*Leptocoma minima*
White-bellied Treepie	*Dendrocitta leucogastra*
BIOME 10: INDIAN PENINSULA TROPICAL MOIST FOREST	
Sri Lanka Frogmouth	*Batrachostomus moniliger*
Indian Swiftlet	*Collocalia unicolor*
Malabar Trogon	*Harpactes fasciatus*
White-cheeked Barbet	*Megalaima viridis*
Malabar Barbet	*Psilopogon malabarica*
Dark-fronted Babbler	*Rhopocichla atriceps*
Loten's Sunbird	*Cynnyris lotenius*
Black-throated Munia	*Lonchura kelaarti*

It is also known for its endemic butterflies such as the Southern Birdwing *Troides minos*, Malabar Rose *Pachliopta pandiyana*, Malabar Tree Nymph *Idea malabarica*, Red Helen *Papilio helenus*, and Malabar Raven *Papilio dravidarum*. Surveys by TNHS have recorded 272 species of butterflies, which is probably the highest number of species recorded for any PA in Kerala and probably the whole of Western Ghats (Kalesh *et al*. 2013). An Odonata survey in May, 2012 by TNHS recorded 69 species of Odonates, and combining with previous studies yielded a total of 93 species of Odonates in the region (Kalesh *et al*. 2012b). An analysis of earlier records and the present survey reveals the presence of at least 45 species of frogs in Shendurney WLS. Of the total 45 species recorded, 38 (84%) are strictly endemic to the Western Ghats and among the endemics, more than 40% are regionally endemic to the Agasthyamalai Hills (Pradeep Kumar *et al*. 2011).

Biju *et al.* (2014) conducted a survey in September 2011 at Shendurney Wildlife Sanctuary and discovered a new species of Dancing Frog. This species was named as Mallan's Dancing Frog *Micrixalus mallani*. This species is restricted to the south of Palghat Gap.

LAND USE

- Forestry
- Conservation

THREATS AND CONSERVATION ISSUES

- Collection of fuelwood and other forest produce
- Livestock grazing
- Crop cultivation

There are no tribal settlements inside the sanctuary, but the right to collection of Minor Forest Produce through Girijan Co-operative Societies is given to nearby tribes. People residing in and around the sanctuary have reported instances of damage to agricultural crops by wild animals, which also cause physical injuries and even death. It is only natural justice that the victims be appropriately compensated. Kerala Government regularly sanctions such payments. Higher altitude regions in the Agasthyamalai landscape apparently has a recent invasion of Ochlandra reed beds replacing montane forests and this can be considered a threat to shola species like Kerala Laughingthrush that has a preferential nesting pattern in forests with low densities of Ochlandra (Chandran & Praveen 2013).

KEY CONTRIBUTORS

The IBA Team, Kalesh Sadasivan.

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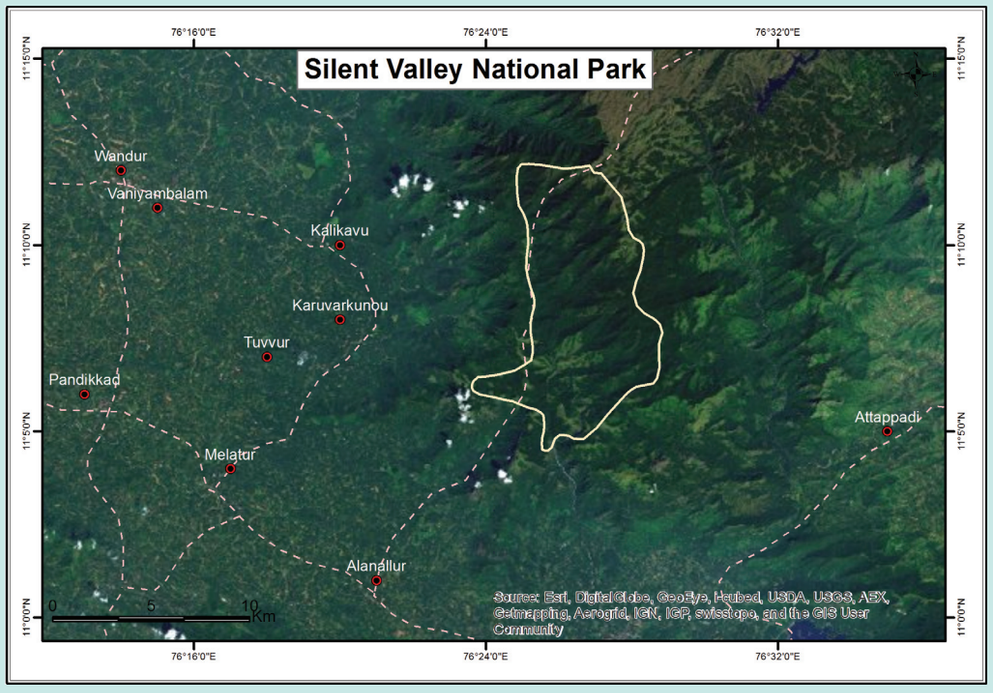
SILENT VALLEY NATIONAL PARK

IN-KL-20

IBA Site	: IN-KL-20	**Rainfall**	: 3,500 mm
Administrative Region (State)	: Kerala	**Temperature**	: 8 ºC to 40 ºC
District	: Palakkad	**Biogeographic Zone**	: Western Ghats
Coordinates	: 11º 07' 54" N, 76° 25' 47" E	**Habitats**	: Southern Tropical Evergreen Forests, Southern Tropical Semi-evergreen forest, Subtropical Hill Forest, Subtropical Montane Grassland, Tropical Deciduous Forest
Ownership	: State		
Area	: 23,674 ha		
Altitude	: 900–2,383 mm		

IBA CRITERIA: A1 (Threatened species), A2 (Endemic Bird Area 123: Western Ghats), A3 (Biome 10: Indian Peninsula Tropical Moist Forest)

PROTECTION STATUS: National Park, established November 1984 with a buffer zone established in June 2007.



GENERAL DESCRIPTION

Silent Valley is a rectangular tableland enclosed by a high contiguous ridge along its northern and eastern borders, and by a lower, irregular ridge along its western and southern borders. It is flanked by steep escarpments to the south and west, which descend some 1,000 m to the plains of Kerala, and by sheer cliffs to the north and east which rise a further 1,000 m to the Upper Nilgiri Plateau. Kunthipuzha river flows southwards through the entire 15 km length of the Park, dividing it into a narrow western sector of less than 2 km and a wider eastern sector of 5 km. The valley is drained by five main tributaries of Kunthipuzha, which originate near the eastern border and flow westwards. Only a few minor streams drain into the Kunthipuzha from the western sector. The river is uniformly shallow, with no floodplains. The riverbed falls from 1,861 m to 900 m over a distance of 12 km, the last 8 km being less steep, with a fall of only 60 m. Kunthipuzha is one of the lest torrential rivers of the Western Ghats, with a pesticide-free catchment area. The soil is blackish and slightly acidic in the evergreen forests, where there is good accumulation of organic matter. The underlying rock in the area is granite with schist and gneiss, which give rise to the loamy laterite soils on slopes (Anon. undated, 1981, 1982; Unnikrishnan, 1989).

On June 6, 2007 the Kerala cabinet approved the proposed buffer zone for the national park. A buffer zone of 147.22 sq. km zone, including 80.75 sq. km taken from Attapady Forest range, 27.09 sq. km from Mannarkkad

Forest range and 39.38 sq. km from Kalikavu Forest range, was consolidated to form a new range. The Bhavani Forest range of 94 sq. km, and 54 sq. km was brought under the existing Silent Valley range of the national park. The total area of the core zone is 8,951.65 ha. The Silent Valley National Park is contiguous with Mukurthi National Park (7,846 ha), Tamil Nadu, on its northeastern boundary. Bhavani range is mostly drained by Bhavani river, that debouches into River Cauvery, and includes several adjacent high altitude habitats.

The altitude of the core zone ranges from 900 m to 2,383 m (Balakrishnan 1984). Most of the core area lies between 880 m and 1,200 m (Anon. undated). High peaks such as Anginda (2,383 m), Sispara (2,206 m), and Kozhipara (1,904 m) occur in the northern part of the park.

Four main types of vegetation can be recognized: Tropical Evergreen Forest, Subtropical Hill Forest, Shola forest, and grasslands which are restricted to the narrow sector, west of the Kunthipuzha and to the higher slopes and hill tops in the eastern sector.

Seven new plant species have been recorded from Silent Valley (Manilal 1988), as well as many rare, endemic, and economically valuable species, such as Cardamom *Elettaria cardamomum*, Pepper *Piper nigrum*, Yam *Dioscorea* spp., various beans *Phaseolus* spp., a pest-resistant strain of Rice (species unknown), and 110 plant species of importance in Ayurvedic medicine (Nair *et al.* 1980).

AVIFAUNA

Kerala's avifauna is well represented within the park and several studies were undertaken in the core area. 200 species of birds have been recorded (Jayson 1990) but this also covers adjacent habitats and hence is misleading. Bashir & Nameer (1993) recorded 153 species from the core zone, while a follow up survey in 1994–1995 recorded 128 species (Nameer 1995). Uthaman (2007) in a series of three surveys spanning all seasons recorded 155 species, while Sashikumar *et al.* (2011) listed a combined total of 191 species for the same area. However, the species diversity in the core area is comparatively less, with a high density of endemic species (32% endemic forms, Uthaman 2007) while the generalist species are stragglers on the edges of the boundary. Five globally Threatened species are found here. The Nilgiri Wood-pigeon *Columba elphinstonii* is an uncommon bird (Zacharias & Gaston 1999, BirdLife International 2001), even in this well protected forest – however, Uthaman (2007) recorded 23 individuals from different base camps, indicating a healthy population. The Indian Broad-tailed Grass-warbler *Schoenicola platyura* has a wide range in the Western Ghats but is uncommon everywhere. Santharam (1996) found it in the Poochipara area in December 1990, while Uthaman (2007) recorded it nine times during the survey. A total of 14 sightings of Nilgiri Pipit *Anthus nilghiriensis* indicate that the wet grass slopes are an important refuge for this species.

This IBA lies in the Western Ghats Endemic Bird Area (EBA) (Stattersfield *et al.* 1998). In this IBA, 15 of the 26 endemics or restricted-range species have been

ENDANGERED	
Nilgiri Laughingthrush	*Strophocincla cachinnans*
Nilgiri Blue Robin	*Myiomela major*
VULNERABLE	
Nilgiri Wood-pigeon	*Columba elphinstonii*
Nilgiri Pipit	*Anthus nilghiriensis*
Indian Broad-tailed Grass-warbler	*Schoenicola platyurus*
NEAR THREATENED	
Pallid Harrier	*Circus macrourus*
Malabar Pied Hornbill	*Anthracoceros coronatus*
Great Hornbill	*Buceros bicornis*
Grey-headed Bulbul	*Pycnonotus priocephalus*
Tytler's Leaf-warbler	*Phylloscopus tytleri*
Black-and-Orange Flycatcher	*Ficedula nigrorufa*
Nilgiri Flycatcher	*Eumyias albicaudatus*
ENDEMIC BIRD AREA 123: WESTERN GHATS	
Nilgiri Wood-pigeon	*Columba elphinstonii*
Malabar Parakeet	*Psittacula columboides*
Malabar Grey Hornbill	*Ocyceros griseus*
Nilgiri Blue Robin	*Myiomela major*
Grey-headed Bulbul	*Pycnonotus priocephalus*
Nilgiri Pipit	*Anthus nilghiriensis*
Wynaad Laughingthrush	*Dryonastes delesserti*
Nilgiri Laughingthrush	*Strophocincla cachinnans*
Indian Rufous Babbler	*Turdoides subrufus*
Indian Broad-tailed Grass-warbler	*Schoenicola platyurus*
Black-and-Orange Flycatcher	*Ficedula nigrorufa*
Nilgiri Flycatcher	*Eumyias albicaudatus*
White-bellied Blue Flycatcher	*Cyornis pallipes*
Small Sunbird	*Leptocoma minima*
White-bellied Treepie	*Dendrocitta leucogastra*
BIOME 10 INDIAN PENINSULA TROPICAL MOIST FOREST	
Sri Lanka Frogmouth	*Batrachostomus moniliger*
Jerdon's Nightjar	*Caprimulgus atripennis*
Indian Swiftlet	*Collocalia unicolor*
Malabar Trogon	*Harpactes fasciatus*
Malabar Pied Hornbill	*Anthracoceros coronatus*
White-cheeked Barbet	*Megalaima viridis*
Malabar Barbet	*Psilopogon malabarica*
Hill Swallow	*Hirundo domicola*
Yellow-browed Bulbul	*Iole indica*
Malabar Whistling-thrush	*Myophonus horsfieldii*
Dark-fronted Babbler	*Rhopocichla atriceps atriceps*
Indian Scimitar-babbler	*Pomatorhinus horsfieldii*
Loten's Sunbird	*Cinnyris lotenius*
Black-throated Munia	*Lonchura kelaarti*

recorded. Birdlife International has recently accepted additional endemics, including Malabar Barbet *Psilopogon malabaricus*, Nilgiri Imperial-pigeon *Ducula cuprea*, and Grey-fronted Green-pigeon *Treron affinis*.

Flocks of Wynaad Laughingthrush *Garrulax delesserti* are sighted up to an elevation of 1,700 m. Above that, it seems to be the range of Black-chinned Laughingthrush *Strophocincla cachinnans cachinnans* and the higher reaches hold an excellent population of this species. Vijayan *et al.* (1999) also found this species in the upper reaches. Both the species confine themselves strictly to their respective altitudinal ranges. Nilgiri Flycatcher *Eumyias albicaudata*, a Near Threatened species, is common in the foothills of the park. Nilgiri Blue Robin *Myiomela major*, another endemic and Endangered species is found in the higher reaches of the park.

Silent Valley is not only a paradise for endemic species, it also host a large number of forest migrants in winter, from the Himalaya and beyond. Some of the forest birds noted are Tickell's Leaf-warbler *Phylloscopus affinis*, Large-billed Leaf-warbler *Phylloscopus magnirostris*, Western Crowned-warbler *Phylloscopus occipitalis*, Tytler's Leaf-warbler *Phylloscopus tytleri* with an excellent population wintering around Sispara (Uthaman 2007, Praveen 2007), Rufous-tailed Flycatcher *Muscicapa ruficauda*, Brown-breasted Flycatcher *Muscicapa muttui*, and Blue-capped Rock-thrush *Monticola cinclorhynchus*.

This site lies in Biome 10 (Indian Peninsula Tropical Moist Forest), where 15 species are representative of this biome's assemblage. Nine of these species have been recorded from Silent Valley NP. Only those species which live in comparatively drier habitats are not found here. For example, the Blue-faced Malkoha *Phaenicophaeus viridirostris*, a bird of scrub and secondary jungle, is not found here.

Much of the newly formed Bhavani range is unexplored except for a few transects covered by Sashikumar *et al.* (2011), while the portions of Mannarkkad range which got merged with Silent Valley NP have been covered during several bird community studies (Bashir & Nameer 1993, Pramod 1999, Jayson 1990). Portions of Kalikavu range, Atti in particular, that forms a part of the buffer zone of the park, was partially covered during a bird survey in Nilambur South Division in 2008 (Nameer *et al.* 2011), and Black-chinned Laughingthrush was recorded there. With the inclusion of this buffer zone, the entire stretch of the Nilgiri slopes in Kerala where this species occurs are within the protected area network.

Silent Valley NP has been selected as an IBA as it qualifies on the basis of three criteria (A1, A2, and A3) and

ASAD R. RAHMANI

Silent Valley is perhaps the most famous conservsation battle of 1970's when a dam was planned on Kunthipuzha river in the centre of the forest. This dam would have destroyed prestineTropical Evergreen Forest. Timely intervention by the prime minister Mrs Indira Gandhi saved the forest and 1984 it ws declared as a National Park

ASAD R. RAHMANI

Silent Valley has Tropical Evergreen Forest Semi-evergreen Forest, Sub-tropical Hill Forest, Sub-tropical Montane grassland and Tropical Deciduous Forest. Out of 26 endemic bird species of the Western Ghats 15 are found in the Silent Valley

more importantly, it has one of the finest undisturbed forests left in the Western Ghats. This famous forest has significant populations of many threatened and endemic birds.

OTHER KEY FAUNA

The faunal diversity of Silent Valley NP is very high and includes a number of endemic and Threatened species. Some 26 species of mammals, excluding bats, rodents, and insectivores, have been recorded (Balakrishnan 1984). Notable species include Nilgiri Langur *Semnopithecus johni*, Lion-tailed Macaque *Macaca silenus*, Tiger *Panthera tigris*, Leopard *Panthera pardus*, Jerdon's Palm Civet *Paradoxurus jerdoni*, Wild Dog *Cuon alpinus*, Nilgiri Marten *Martes gwatkinsi*, Asiatic Elephant *Elephas maximus*, Gaur *Bos gaurus*, and Nilgiri Tahr *Nilgiritragus hylocrius*, some of which are endemic to the Western Ghats. Estimates of large mammal populations are provided by Balakrishnan (1984). Six species of bats have been recorded, of which Peshwa's Bat *Myotis peshwa* and Hairy-winged Bat *Harpiocephalus harpia* are considered rare. Amphibians total 19 species, lizards 9 species, and snakes 11 species (Kerala Forest Department 1990). Notable amphibian records are the primitive caecilian *Ichthyophis longicephalus* and Malabar Tree Toad *Nectophryne tuberculosa*. Lepidoptera comprise *c.* 100 species of butterflies and *c.* 400 of moths, of which 13 are endemic to south India, and now have very restricted distributions, mostly within the Western Ghats (Mathew 1990).

The ichthyodiversity currently comprises 23 species (Bijukumar *et al*. 2013). Of which, three have been assessed at high risk of extinction (one as Endangered and two Vulnerable) in the IUCN Red List of Threatened species. Two species, *Balitora jalpalli* and *Mesonoemacheilus remadevii* are endemic to Silent Valley NP, while two more species, *Homaloptera menoni* and *H. pillaii* are found both in the Silent Valley NP and the adjoining IBA Siruvani-Muthikulam RF. Comprehensive surveys and taxonomic revision of currently known species may result in the discovery and description of several new species, which are endemic to this region.

Biju *et al*. (2011) describes 12 new species of Night Frogs from the Western Ghats region. In a survey conducted in June 2006, a new species of Night Frog was reported from Vallakadavu, Periyar Tiger Reserve. This species was named as *Nyctibatrachus periyar*.

LAND USE

Nature conservation and research

Forestry

THREATS AND CONSERVATION ISSUES

Unregulated tourism Pressure

A large number of people in the Mannarghat plains depend directly on the perennial flow of water in Kunthipuzha. The whole cultural fabric of these people is woven around the fact that this river retains its flow even in the harshest of summer. Bharathapuzha, which receives the water from

MRUGANK PRABHU

Ghatophryne rubigina (Pillai and Pattabiraman, 1981) was described from the fast flowing streams of Silent Valley National Park (above). This species is endemic to southern Western Ghats and only known from its type locality (below)

P.O. NAMEER

Kunthipuzha is dry, except for this lean flow through the summer heat.

The greatest threat to the forest of Silent Valley has been warded off with the abandonment of the hydroelectric power project and dam, and the consequent declaration of the national park. However, the imminent threat from the demand for a new dam at Patrakadav within Silent Valley has not been completely mitigated and might come back as a potential threat to this unique ecosystem in the future. Silent Valley is at the top of the agenda of ecotourists but uncontrolled tourism can destroy the forest environment. A constant vigil and check on all these major factors is essential to the well-being of the national park.

KEY CONTRIBUTOR

IBA Team, Praveen J., P.O. Nameer.

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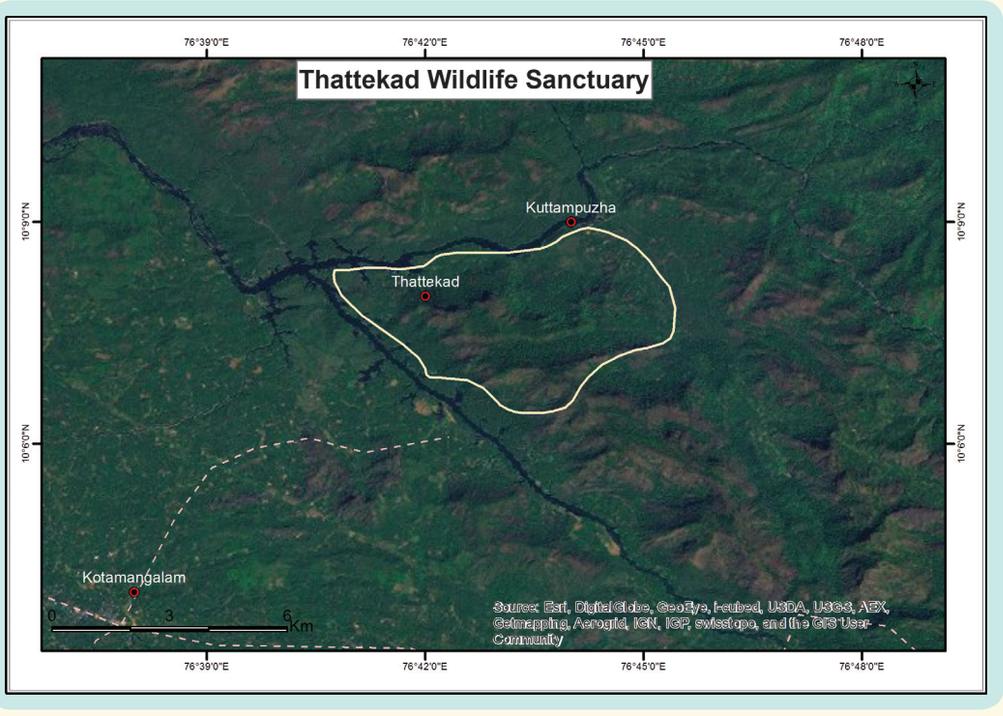
THATTEKAD WILDLIFE SANCTUARY

IBA Site Code	: IN-KL-21	**Rainfall**	: 2,500 mm
Administrative Region (State)	: Kerala	**Temperature**	: 22 ºC to 31.5 ºC
District	: Idukki	**Biogeographic Zone**	: Western Ghats
Coordinates	: 76º 40' to 76º 45' E, 10º 7' to 11º N	**Habitats**	: Tropical Wet Evergreen Forest, Tropical Semi-evergreen Forest, Tropical Moist Deciduous Forest, Myristica swamps, Riparian Forest, Plantations
Ownership	: Kerala Forest Department		
Area	: 2,516 ha (25.16 sq. km)		
Altitude	: 35–523 msl		

IBA CRITERIA: A1 (Threatened species), A2 (Endemic Bird Area 123: Western Ghats), A3 (Biome 10: Indian Peninsula Tropical Moist Forest)

PROTECTION STATUS: Wildlife Sanctuary, established August, 1983.



GENERAL DESCRIPTION

Thattekad Wildlife Sanctuary (also known as Dr. Sálim Ali Bird Sanctuary) is situated in Kothamangalam *taluka* of Ernakulam district, on the northern bank of River Periyar. Rivers Periyar and Edamalayar meet at Koottickel before reaching Bhoothathankettu Dam. The Periyar and Kuttampuzha rivers on two sides, and Kolombathodu and Orulamthanni on the other two sides, border the sanctuary. The southeast boundary is the reserve forest of Neriyamangalam Range over a distance of 5 km. Kuttampuzha village is located on the eastern and northeastern sides. Most parts of the sanctuary area are hilly and covered by forest (Varghese 2012).

Thattekad lies at the base of the western slopes of the Western Ghats. The highest point in the Western Ghats, Anaimudi Peak (2,695 m), is directly uphill of Thattekad. The terrain is undulating and includes two high peaks, Thoppimudi (488 m) and Njayapillimudi (523 m). Bhoothathankettu Barrage has created a large waterbody, 6 to 10 m deep. This has destroyed almost all the luxuriant riverine forest which existed along the banks. About one-tenth of the sanctuary area is under monoculture of Teak *Tectona grandis* (216.37 ha) and Mahogany *Swietenia mahagoni* (6.67 ha). The rest of the forest consists of somewhat disturbed Evergreen, Semi-evergreen, and Moist Deciduous tracts and grassland with rocky outcrops. There

are some private holdings, ranging from 0.02 ha to 6.07 ha or more along the fringes of the sanctuary,and *c.* 9 sq. km of private land (human settlement) inside the PA. Since its declaration as a sanctuary in 1983, there have been no regular forestry extraction and plantation activities inside the sanctuary area. As a result, there is fairly thick undergrowth everywhere, including in the plantation. There is a proposal to exclude the human settlement from the Notified Area, and to add an equivalent reserve forest area from Neriyamangalam Range to the PA, which is under the consideration of the State Wildlife Board.

During his visit to Thattekad in the 1930s, Sálim Ali described it as the richest bird habitat in peninsular India, comparable only with the Eastern Himalaya. In 1983, the Government of Kerala declared it as a bird sanctuary on his recommendation.

AVIFAUNA

Thattekad is a birdwatcher's paradise, and its importance was appreciated by Dr. Sálim Ali, who recorded 167 bird species here (Ali 1969). Later, Sugathan & Varghese (1996) recorded 269 species from this IBA. However, Santharam (2000) questioned several additions in their list due to insufficient data. In 2009, during the Travancore-Cochin Ornithological Survey, 166 species of birds were recorded from the sanctuary. During the Bird Diversity Survey of Idukki Wildlife Division in 2013, 141 species of birds were recorded from Thattekkad WLS. The checklist in *Birds of Kerala: Status & Distribution* (Sasikumar *et al*. 2011a) mentions 250 species.

The drying streams of Thattekkad provide good habitat for Nilgiri Thrush *Zoothera neilgherriensis*, which otherwise occurs at higher altitudes (Praveen *et al*. 2014). Five sightings were made at a single spot in Urlanthanni, and were photographed by Sarath S. and Vishnu Sivadas.

Thattekad has two globally Threatened species, and four Near Threatened species. It also has 15 Western Ghats endemics. The site lies in the Western Ghats Endemic Bird Area (EBA 123). In this EBA, 16 species were identified by Stattersfield *et al*. (1998) but now 26 species have been reported to be endemic to the Western Ghats (according to the classification of Rasmussen & Anderton 2015, 2012 and del Hoyo & Collar 2014).

Although Thattekad is well protected, species composition and density have changed. For example, Ali & Whistler (1936) and Ali (1964) found Wynaad Laughingthrush *Garrulax delesserti* to be one of the commonest birds in Thattekad in the humid rainforest and dense undergrowth. The Travancore-Cochin Ornithological Survey was repeated in 2009, when seven of the Western Ghats Endemics and 17 avian species of Schedule I of the Wildlife (Protection) Act, 1972 were recorded. Habitat specialists such as Great

P.O. NAMEER

Thattekad Wildlife Sanctuary, also known as Dr. Sálim Ali Bird Sanctuary, is very popular amongst birdwatchers as more than 250 bird species have been identified here

VULNERABLE	
Nilgiri Wood-pigeon	*Columba elphinstonii*
Indian Broad-tailed Grass-warbler	*Schoenicola platyurus*
NEAR THREATENED	
Oriental Darter	*Anhinga melanogaster*
Lesser Fish-eagle	*Ichthyophaga humilis*
Pallid Harrier	*Circus macrourus*
Malabar Pied Hornbill	*Anthracoceros coronatus*
Grey-headed Bulbul	*Microtarsus priocephalus*
ENDEMIC BIRD AREA 123: WESTERN GHATS	
Nilgiri Wood-pigeon	*Columba elphinstonii*
Malabar Parakeet	*Psittacula columboides*
Malabar Grey Hornbill	*Ocyceros griseus*
Wynaad Laughingthrush	*Garrulax delesserti*
Indian Rufous Babbler	*Turdoides subrufus*
Small Sunbird	*Leptocoma minima*
White-bellied Treepie	*Dendrocitta leucogastra*
Flame-throated Bulbul	*Pycnonotus gularis*
Nilgiri Flowerpecker	*Dicaeum concolor*
Malabar Woodshrike	*Tephrodornis sylvicola*
Malabar Starling	*Sturnia blythii*
Nilgiri Thrush	*Zoothera neilgherriensis*
White-bellied Blue Flycatcher	*Cyornis pallipes*
Malabar Barbet	*Megalaima malabarica*
BIOME 10: INDIAN PENINSULA TROPICAL MOIST FOREST	
Sri Lanka Frogmouth	*Batrachostomus moniliger*
Malabar Trogon	*Harpactes fasciatus*
Malabar Pied Hornbill	*Anthracoceros coronatus*
White-cheeked Barbet	*Megalaima viridis*
Malabar Barbet	*Megalaima malabarica*
Malabar Whistling-thrush	*Myophonus horsfieldii*
Dark-fronted Babbler	*Rhopocichla atriceps*
Loten's Sunbird	*Nectarinia lotenia*
Black-throated Munia	*Lonchura kelaarti*

Pied Hornbill *Buceros bicornis* and Malabar Pied Hornbill *Anthracoceros coronatus*, and Jerdon's Bush-lark *Mirafra affinis* have disappeared from the area. Interestingly, Malabar Grey Hornbill *Ocyceros griseus*, which was not recorded in 1933, has been found to be very common now. Oriental Darter *Anhinga melanogaster* and Lesser Fish-eagle *Ichthyophaga humilis*, both Near Threatened, were birds recorded here during the Sashikumar *et al.* (2011b) survey. Of the Western Ghats endemics, 19 taxa, including races, were recorded during the Bird Diversity Survey 2013 (Praveen *et al.* 2014) in Thattekkad WLS. It is interesting to note that this IBA supports a good population of the Near Threatened endemic Grey-headed Bulbul *Pycnonotus priocephalus*.

Thattekad lies in Biome 10 (Indian Peninsula Tropical Moist Forest), according to BirdLife International (undated). Biome 10 has 15 species, of which nine have been identified from Thattekad.

One of the interesting species is the Sri Lanka Frogmouth *Batrachostomus moniliger*, a bird of undisturbed rainforest. While Sugathan & Varghese (1996) say it is rare, Simpson (2000), who did two nights' birdwatching at this site, found it "very common, both inside and outside the sanctuary; 10+ heard in three hours in one evening."

According to Sugathan & Varghese (1996), Indian Broad-tailed Grass-warbler *Schoenicola platyura* is resident but not common. It affects grass- and scrub-covered hillsides.

OTHER KEY FAUNA

A total of seven species of mammals that are found in the PA are protected under Schedule I of WLPA, which include Grey Slender Loris *Loris lydekkerianus*, Tiger *Panthera tigris*, Leopard *P. pardus*, Asiatic Elephant *Elephas maximus*, Mouse Deer *Moschiola indica*, Indian Pangolin *Manis crassicaudata*, and Sloth Bear *Melursus ursinus*. Another eight species listed under Schedule II of WLPA including a Western Ghats endemic species, the Nilgiri Striped Squirrel *Funambulus sublineatus*, are also seen here. Spiny Tree Mouse or Malabar Spiny Dormouse *Platacanthomys lasiurus* and Nilgiri Striped Squirrel, both Vulnerable, have been recorded (Molur & Nameer 2008, Rajamani *et al.* 2008).

Draco or Gliding Lizard *Draco dussumieri* is common in evergreen and semi-evergreen forests. Among the Amphibians, 16 species belonging to three families were recorded here (Andrews *et al.* 2005). During 2012–2014, a survey recorded 153 species of butterflies in Thattekkad which belong to five families. Of these, 13 are endemic to the Western Ghats. Notable species are Malabar Flash, Common Three-ring, Cornelian, Blue Oakleaf, Travancore Evening Brown, Lesser Albatross, and Orchid Tit (Unnikrishnan & S. Pulikkal, *pers. comm.* 2014).

A study revealed 82 species of Odonata, including 51 species of dragonflies and 31 of damselflies. Of these, 21 are endemic to the Western Ghats. The area was found to be rich in odonate diversity (Varghese *et al.* 2014). The rare *Lyriothemis tricolor*, which is known to use tree holes as its larval habitat, was found in Thattekkad (Das *et al.* 2013).

LAND USE

- Nature conservation and research
- Forestry
- Tourism

THREATS AND CONSERVATION ISSUES

- Cattle grazing
- Firewood collection
- Human settlement inside PA
- Exotic and invasive weeds
- Human-wildlife conflict

A small township has developed at Kuttampuzha, adjacent to Thattekkad WLS. Part of Kuttampuzha village lies within the sanctuary. The land assigned on either side of Thattekkad-Pooyamkutty road for cultivation had

expanded into the forestland. Consolidating the boundary by building permanent cairns has arrested degradation. The adjoining areas are industrially backward. The main occupation of the villagers is agriculture (rubber, paddy, fishing), and to meet their various needs, they enter the forest illegally. Even though the majority is economically sound, many of them, including the unemployed, go into the forest to fell trees illicitly. The people residing in the adjoining lands (*patta* land) and occupied land pose a real threat to the sanctuary. A strong environment education movement involving the local people is needed to show them the importance of this IBA. As this IBA is popular among tourists, anthropogenic pressure is exerted on the ecosystem (home stays and resultant disturbances). The impact of tourism on the status of Sri Lanka Frogmouth should be studied.

VINAYAK YARDI

Lesser Fish-eagle *Ichthyophaga humilis* is often seen near water in Thattekad Wildlife Sanctuary

Thattekad WLS bears a good representation of tropical birdlife. Hence, the sanctuary should be taking a lead in systematic ornithological studies by trained personnel. The studies should include bird-ringing, tagging, and territory mapping, longevity studies on tagged birds, molecular studies, studies on breeding success rate, and focused studies to understand the status of nocturnal birds in Thattekad WLS.

KEY CONTRIBUTORS

The IBA Team, Vishnupriyan Kartha.

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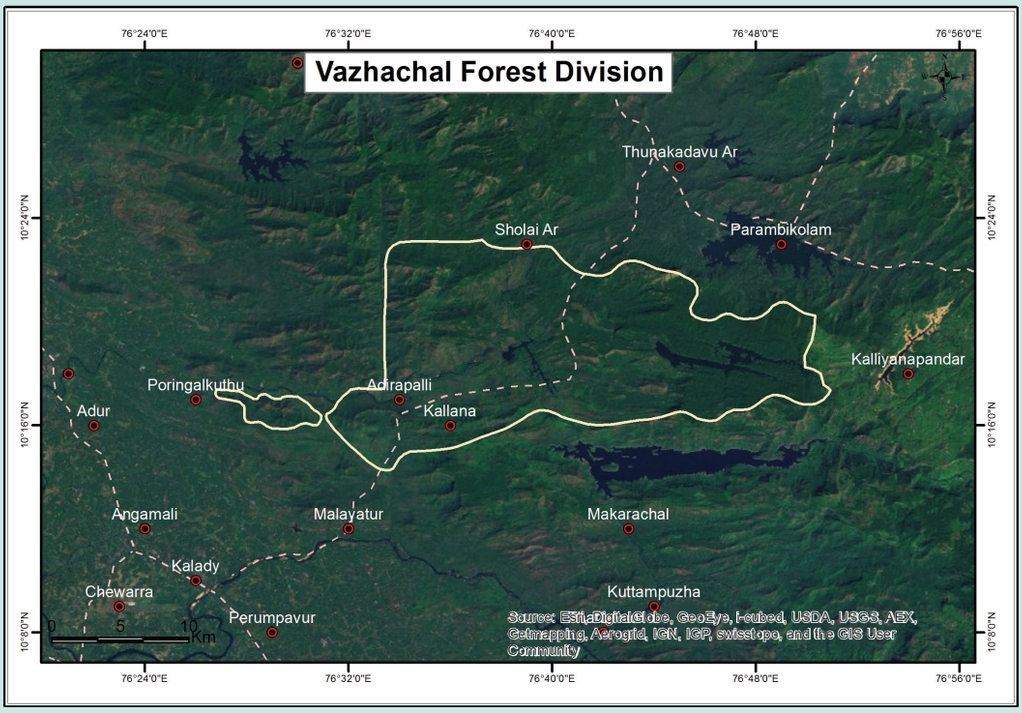
VAZHACHAL FOREST DIVISION

IBA Site Code	: IN-KL-22	**Rainfall**	: 3,000 mm
Administrative Region (State)	: Kerala	**Temperature**	: 14 ºC to 36 ºC
Districts	: Thrissur, Ernakulam	**Biogeographic Zone**	: Western Ghats
Coordinates	: 10° 19' 4.0440" N, 76° 42' 7.4880" E	**Habitats**	: Low elevation Riparian, Evergreen, degraded Semi-evergreen, and Moist Deciduous Forests, Teak and Oil Palm plantations
Ownership	: State		
Area	: 41,300 ha		
Altitude	: 200–1,300 msl		

IBA CRITERIA: A2 (Endemic Bird Area 123: Western Ghats), A3 (Biome 10: Indian Peninsula Tropical Moist Forest)

PROTECTION STATUS: Reserve Forest, not officially protected.



GENERAL DESCRIPTION

Vazhachal Forest Division lies in Mukundapuram *taluka* of Trichur district and Aluva *taluka* of Ernakulam district. The Division started functioning from April 26, 1985. It is a long and narrow tract of *c.* 413 sq. km (Karim 1990). The Division comprises four forest ranges, namely Athirappally Charpa, Vazhachal, and Kollathirumedu. A part of Sholayar Range (earlier under Vazhachal Division) and Charpa Range are now part of Parambikulam Tiger Reserve, but continue to be administered by Vazhachal. The highly undulating terrain varies from 200 m to a maximum height of 1,300 m (Karimala Komban in Sholayar Range). These forests are situated on the western slopes of the Western Ghats, and therefore receive copious rainfall. The eastern side of the division is more rugged than the west.

Most parts of Vazhachal Reserve Forest (RF) consist of West Coast Tropical Wet Evergreen, West Coast Tropical Semi-evergreen, Southern Tropical Moist Mixed Deciduous, and low elevation Riparian Forests.

The low elevation forests of Vazhachal are an important habitat for three types of hornbills, possibly the most important habitat for hornbills in the entire Western Ghats (Mudappa & Shankar Raman 2009). These forests are also the last remaining nesting habitat of the Malabar Pied Hornbill in the Kerala part of Western Ghats.

Chalakudy river, which flows through Vazhachal RF, originates in the Anamalai region of Tamil Nadu, but it has some major tributaries originating from Parambikulam, Kuriyarkutti, Sholayar, Karapara, and Anakayam in Kerala. It is one of very few rivers of Kerala with substantial relics of riparian vegetation. Thick riparian forest is present in the Poringalkuthu area of Vazhachal Range.

The Tropical Evergreen Forests of Vazhachal have species of *Dipterocarpus*, *Vateria*, *Palaquium*, and *Machilus*. The Semi-evergreen Forests are dominated by *Artocarpus*, *Hopea*, and *Tetrameles*. In the areas with Moist Deciduous vegetation, *Tectona grandis* and species of *Dalbergia*, *Lagerstroemia*, *Pterocarpus*, *Terminalia*, *Grewia*, *Bombax*, and *Emblica* are generally found.

AVIFAUNA

Initially, a few short bird surveys were conducted in Vazhachal Reserve Forest (Nameer & Cheeran 1996; Susanth Kumar 1996). Later, a more detailed avifaunal survey was conducted in February, 2008 that recorded 180 species, six of which are globally Threatened. Subsequently, birdwatchers added more species, bringing the total close to 200 species (ebird data, December 2014).

Significant records include Lesser Fish-eagle *Ichthyophaga humilis* and Malabar Pied Hornbill *Anthracoceros coronatus*. Both species are recorded in good numbers at Athirappally and Vazhachal, one of their remaining strongholds in Kerala. Riparian forests also hold significant numbers of another Near Threatened bird, the Grey-headed Bulbul *Pycnonotus priocephalus*.

Other uncommon birds seen are Great Pied Hornbill *Buceros bicornis*, Great-eared Nightjar *Lyncornis macrotis*, Rufous-bellied Eagle *Hieraaetus kienerii*, Oriental Darter *Anhinga melanogaster*, and Broad-billed Roller *Eurystomus orientalis*.

Vazhachal RF lies in the Western Ghats Endemic Bird Area (EBA 123). Altogether 26 species have been identified as typical of this EBA, and 14 of them have been listed in Vazhachal by Nameer & Praveen (2008).

The site lies in Biome 10 (Indian Peninsula Tropical Moist Forest), and nine of its 15 biome-restricted species have been observed in Vazhachal.

This site fits two IBA criteria: A2 (restricted-range species: EBA 123) and A3 (biome-restricted assemblages). It is also included in the IBA list as it has good Tropical Secondary Evergreen, Tropical Wet Evergreen, and Tropical Moist Deciduous Forests, representative of the Western Ghats Endemic Bird Area.

OTHER KEY FAUNA

The mammals known to be present in the forests are Tiger *Panthera tigris*, Leopard *P. pardus*, Wild Dog *Cuon alpinus*, Barking Deer *Muntiacus muntjak*, Sambar *Rusa unicolor*, Spotted Deer *Axis axis*, Mouse Deer *Moschiola indica*, Sloth Bear *Melursus ursinus*, Nilgiri Langur *Semnopithecus johnii*, and Indian Giant Squirrel *Ratufa indica*. A small population of Lion-tailed Macaque *Macaca silenus* is present in Malakkappara area. The Vulnerable Nilgiri Marten *Martes gwatkinsii* has been sighted here.

NEAR THREATENED	
Oriental Darter	*Anhinga melanogaster*
Great Pied Hornbill	*Buceros bicornis*
Grey-headed Bulbul	*Microtarsus priocephalus*
Lesser Fish-eagle	*Ichthyophaga humilis*
Malabar Pied Hornbill	*Anthracoceros coronatus*
River Tern	*Sterna aurantia*

ENDEMIC BIRD AREA 123: WESTERN GHATS	
Grey-fronted Green-pigeon	*Treron affinis*
Malabar Grey Hornbill	*Ocyceros griseus*
Malabar Barbet	*Megalaima malabarica*
Malabar Parakeet	*Psittacula columboides*
Malabar Woodshrike	*Tephrodornis sylvicola*
White-bellied Treepie	*Dendrocitta leucogastra*
Grey-headed Bulbul	*Microtarsus priocephalus*
Flame-throated Bulbul	*Pycnonotus gularis*
Rufous Babbler	*Turdoides subrufa*
Wynaad Laughingthrush	*Garrulax delesserti*
White-bellied Blue Flycatcher	*Cyornis pallipes*
Malabar Starling	*Sturnia blythii*
Nilgiri Flowerpecker	*Dicaeum concolor*
Small Sunbird	*Leptocoma minima*

BIOME 10 INDIAN PENINSULA TROPICAL MOIST FOREST	
Blue-faced Malkoha	*Phaenicophaeus viridirostris*
Indian Swiftlet	*Aerodramus unicolor*
Malabar Pied Hornbill	*Anthracoceros coronatus*
White-cheeked Barbet	*Megalaima viridis*
Malabar Barbet	*Megalaima malabarica*
Malabar Whistling-thrush	*Myophonus horsfieldii*
Yellow-browed Bulbul	*Acritillas indica*
Dark-fronted Babbler	*Rhopocichla atriceps*
Loten's Sunbird	*Nectarinia lotenia*

The IBA is a good habitat for the rare and Endangered Cochin Forest Cane Turtle *Vijayachelys silvatica*. The Endangered amphibian *Nasikabatrachus sahyadrensis* is present.

Raghavan *et al.* (2008) have studied the fish fauna of Chalakudy river and its tributaries. The National Bureau of Fish Genetic Resources (NBFGR), Lucknow has recommended that the upstream areas of Chalakudy river be declared as a fish sanctuary. Of the 152 species of freshwater fishes known from Kerala, 98 are reported from the river. Of these, 35 are endemic to the Western Ghats, 11 are Vulnerable, 16 Endangered, and four Critically Endangered (Ajithkumar *et al.* 1999).

PUTTU C.

Most parts of Vazhachal Reserve Forest consist of west coast tropical wet evergreen, west coast tropical semi-evergreen, southern tropical moist mixed deciduous, and low elevation riparian forests. Out of 26 endemic birds of the Western Ghats, 14 including the Malabar Barbet *Megalaima malabarica* are found in this IBA

The IBA has 319 species of flowering plants identified, including 24 endemic to the Western Ghats, and 10 Endangered, according to IUCN.

LAND USE

- Forestry
- Nature conservation and research

THREATS AND CONSERVATION ISSUES

Vazhachal RF has two beautiful waterfalls, Athirappally and Charpa, and rapids at Vazhachal, which attract millions of tourists from all over the world (Karim 1990). Chalakudy river has five dams, and hundreds of lift irrigation and drinking water schemes. The upper catchment areas of Chalakudy river have been heavily deforested since the British period, replacing primary forest with Teak and Oil Palm plantations. The Government of Kerala proposed several hydel projects in this river basin, including the most opposed one – the Athirappally Hydro Electric Project. The proposal to commission this would have rung the death knell of this habitat, had the importance of the unique hornbill habitat not been recognized. Chalakudy river basin and forests are the only home of the hunter-gatherer Kadar tribe. The proposed Athirappally project, it is believed, would adversely affect this already scattered group. Elephant migratory route connecting Parambikulam WLS with Pooyamkutty forests also passes through the submergence area of the proposed dam.

The WGEEP (Gadgil) Report, having consulted various stakeholders, recommended that the project should not be permitted. The HLWG (Kasturirangan) Report, however, suggests that the Kerala State Government could approach the Government of India, based on its new guidelines for the Western Ghats. The matter is pending in the Kerala High Court.

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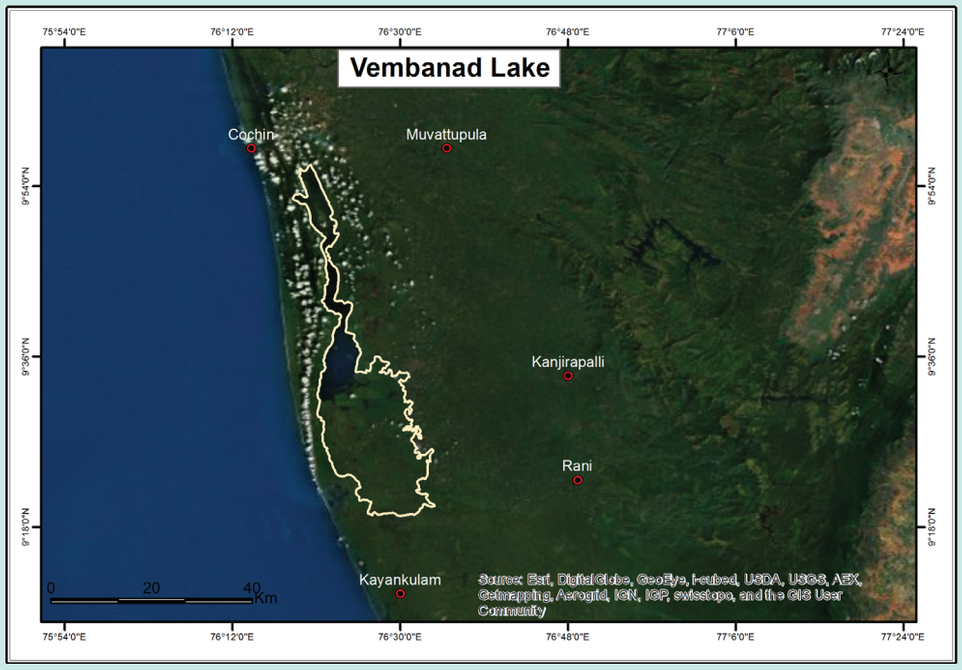
VEMBANAD LAKE

IN-KL-23

IBA Site	:	IN-KL-23	**Altitude**	:	1–2,383 msl
Administrative Region (State)	:	Kerala	**Rainfall**	:	4,000–5,000 mm
District	:	Ernakulam, Kottayam, Alappuzha, Pathanamthitta	**Temperature**	:	20 °C to 35 °C
			Biogeographic Zone	:	Western Ghats
Coordinates	:	9° 35' 60" N, 76° 23' 30" E	**Habitats**	:	Delta, Paddyfields, Littoral Forest, Freshwater Swamp
Ownership	:	Private, Government			
Area	:	110,000 ha			

IBA CRITERIA: A1 (Threatened species), A4i (≥1% biogeographic population), A4iii (≥20,000 waterbirds)

PROTECTION STATUS: Not protected.



GENERAL DESCRIPTION

This region is an integral part of the Vembanad-Kole Ramsar site and is a coastal lagoon. It has a single, relatively narrow opening to the sea, and must have been formed by the detritus from six perennial rivers resulting in a narrow sand bar projecting west from the seashore. These rivers, namely Achankoil, Pamba, Manimala, Meenachil, Moovatupuzha, and part of Periyar originating in the Western Ghats, along with an annual rainfall of 4,000 to 5,000 mm and with extremely steep gradients in the channel, bring down a considerable quantity of detritus to this deltaic landscape. Over a period of time, the sand bar consolidated and stretched from near Kayamkulam in the south to Kochi in the north. The only mouth of the enclosed shallow deltaic body is at Kochi. The lagoon thus formed is called the Vembanad backwater. Thus, Vembanad extends north-south, parallel to the shoreline, and is widest at its southern extremity, forming a bowl located about 3 m below msl. In addition, during the rainy season, from July to October, surplus rain water extends the waterbody by 100–150 sq. km, which recedes during summer. Seawater flows inland through the Kochi mouth and gradually moves inland. By February-March, salinity reaches all parts of Vembanad. However, the salinity has a gradient with the highest level near the northern sea mouth. All the six rivers emptying into the backwaters form braided channels, which join and split repeatedly. As Vembanad has been under human occupation for a long time, the natural vegetation has all but disappeared, except in the sacred groves of temples. A tiny portion of the once extensive Lowland Wet Evergreen Forest

survives in a few sacred groves. From the Vembanad and associated Kuttanad wetlands, 281 species of hydrophytes and wetland-dependent plants were reported (Unnikrishnan 2012). Ravi (2002) listed six species of mangrove (*Avicennia officinalis*, *Bruguiera gymnorrhiza*, *Rhizophora apiculata*, *R. mucronata*, *Sonneratia caseolaris*, *Kandelia candel*), and 17 species of marsh and mangrove associates from Kumarakom heronry.

AVIFAUNA

The ornithological history of this region starts with the Travancore-Cochin Ornithological Survey by Dr. Sálim Ali, who visited Kuttanad and Vembanad Lake (Ali & Whistler 1935–1937). He mentioned large flocks of resting migratory ducks in the placid Vembanad Lake (Ali 1969, Ali & Ripley 1987). Many of the local farmers are well aware of the seasons during which birds like spoonbills, flamingos, pelicans, storks, and ducks arrive in these wetlands. They have vernacular names for most of the common birds of this region (*see* Narayanan 2004).

Neelakantan (1996), Chandy (2003), Narayanan *et al.* (2005), Rakesh *et al.* (2008), and Narayanan *et al.* (2011) reported and studied certain aspects of the avifauna of this region. The Nature Education Society, Thrissur (NEST) was perhaps the first to publish a comprehensive checklist of the birds of Vembanad Lake (Anon 1993). The mid-winter Asian Waterbird Census (AWC, formerly Asian Waterfowl Count) continues to be a major event. AWC is conducted regularly in the Kerala Tourism Development Corporation (KTDC) Tourist Complex since 1987 by B. Sreekumar. Systematic bird counts at eight sites around the Vembanad region were first done in 1993 by NEST, Vembanad Nature Club, Muhamma, and the Department of Forests and Wildlife, Government of Kerala (Anon. 1993). After a gap of eight years, Kottayam Nature Society started conducting wetland bird counts at 10 representative sites as part of the Asian Waterbird Census, in association with the Kerala Forest and Wildlife Department (Sreekumar 2001–2006, 2008; Narayanan & Sreekumar 2010**,** 2012). The total number of all bird species of different habitats (water, forest, grasslands, agricultural fields, and urban areas) comes to 232 (Narayanan & Sreekumar 2012).

So far, 81 wetland and wetland-dependent bird species have been identified from 10 sectors during the Vembanad Waterbird Count from 2001 to 2012 (Narayanan & Sreekumar 2012). The maximum number of species were recorded in 2012 (64 species) and the minimum were reported in 2001 (36 species). On an average, *c.* 50 species were recorded in the counts over these years. Among the various sectors, the Lake showed maximum bird species richness (26.58±6.54) and Pathiramanal sector showed the minimum richness (12.75±2.86). Among the 81 species recorded, 47 are migrants. A total of 23,598 individual birds were counted from ten sectors during 2001 to 2012. The number of birds fluctuated widely over the years, the maximum being recorded in 2008 (31,357 individuals) and the minimum (11,962 individuals) in 2006. Among the 10 sectors, Kaippuzhamuttu ranked first with an average of 6,634 birds and KTDC Tourist Complex with the least number of individuals in the 12 years of survey.

Waterbird counts of the last 14 years in Vembanad area show considerable variation or fluctuation in the bird population, especially migrant birds which constitute the majority. The total number of birds counted was highest in 2008 and in 2012. There is a decline in the bird population and there are changes in the species composition in some important habitats of this wetland. For instance, tens of thousands of ducks and teals collect in certain daytime refuges in winter at Vembanad Lake around Pathiramanal Island (Ali & Ripley 1987), and fly inland at night to feed in inundated paddy fields and on reedy marginal shallows of tanks (Ali 1969). During 2001, only a hundred odd ducks were seen here. The greatest decline in the recent past has been among Northern Pintail *Anas acuta*, Garganey *Querquedula querquedula*, and Common Teal *A. crecca*. However, some species have shown an increase. For example, Lesser Whistling-duck *Dendrocygna javanica* and Barn Swallow *Hirundo rustica* showed an increase in number (Narayanan & Sreekumar 2012).

The numbers of many species of waterbirds such as Oriental Darter *Anhinga melanogaster*, Little Cormorant *Microcarbo niger*, Indian Cormorant *P. fuscicollis*, Black-crowned Night-heron *Nycticorax nycticorax*, and Glossy Ibis *Plegadis falcinellus* were above their 1% biogeographic population threshold (Narayanan *et al.* 2011). During the winter, large congregations of Black-tailed Godwit *Limosa limosa* and Eurasian Spoonbill *Platalea leucorodia* are recorded from various areas of the IBA, especially from the Upper Kuttanad region, with numbers well above their 1% biogeographic population threshold. Earlier studies showed the presence of much more than 1% biogeographic population threshold of the migratory Garganey at Vembanad (Anon. 1993). More recently, its numbers are reported to be reduced considerably at this region (Narayanan & Sreekumar 2010).

Despite the decrease in duck numbers due to increased disturbance by motorboats, Vembanad Lake still has great potential to bring them back to their former numbers, if motorboat movement is controlled. We have included this site in the IBA list as it still has great potential to attract large numbers of other waterbirds as well, once corrective measures are undertaken.

OTHER KEY FAUNA

Certain species became locally extinct (e.g., Sawfish *Pristis* sp., Salt-water Crocodile *Crocodylus porosus*, Mugger *Crocodylus palustris*, Indian Pangolin *Manis crassicaudata*)

VULNERABLE	
Asian Woollyneck	*Ciconia episcopus*
Greater Spotted Eagle	*Clanga clanga*
Indian Spotted Eagle	*Clanga hastata*
NEAR THREATENED	
Spot-billed Pelican	*Pelecanus philippensis*
Oriental Darter	*Anhinga melanogaster*
Painted Stork	*Mycteria leucocephala*
Black-headed Ibis	*Threskiornis melanocephalus*
Ferruginous Duck	*Aythya nyroca*
River Tern	*Sterna aurantia*
Grey-headed Fish-eagle	*Ichthyophaga ichthyaetus*
Black-tailed Godwit	*Limosa limosa*
European Roller	*Coracias garrulus*
A4i: 1% BIOGEOGRAPHICAL THRESHOLD	
Little Cormorant	*Microcarbo niger*
Indian Cormorant	*Phalacrocorax fuscicollis*
Oriental Darter	*Anhinga melanogaster*
Little Egret	*Egretta garzetta*
Great Egret	*Egretta alba*
Intermediate Egret	*Egretta intermedia*
Black-crowned Night-heron	*Nycticorax nycticorax*
Black-headed Ibis	*Threskiornis melanocephalus*
Glossy Ibis	*Plegadis falcinellus*
Black-tailed Godwit	*Limosa limosa*
Whiskered Tern	*Chlidonias hybrida*

or rare (e.g., various estuarine fishes), or are uncommon these days. At the same time, some reptiles (e.g., *Naja naja*, *Varanus bengalensis*) and mammals (*Felis chaus*, *Funambulus tristriatus*) are expanding their range to the core areas of this wetland (Narayanan & Sreekumar 2012).

Vembanad Lake is famous for its fisheries. So far, 88 species of fishes, six species of earthworms, 10 species of shrimps and prawns, 122 spider species, 47 species of dragonflies and damselflies, 111 butterflies species, 17 species of amphibians, 27 species of reptiles, and 20 species of mammals have been recorded from these wetlands (Narayanan & Sreekumar 2012).

LAND USE

- Agriculture
- Tourism and recreation
- Housing

THREATS AND CONSERVATION ISSUES

- Landscape alteration
- Poaching
- Overgrowth of exotic vegetation (e.g. *Eichhornia crassipes*, *Salvinia adnata*, *Cabomba caroliniana*)
- Uncontrolled pesticide usage
- Felling of nesting trees
- Tourism
- Unregulated development

Over the last few centuries, the wetlands of this IBA are being reclaimed for agriculture. The shallow margins, with minimum flood impact and better soil suitable for agriculture (*c*. 302 sq. km) have been reclaimed by erecting bunds which are then stabilized with coconut cultivation (Anon. 1993). Since the early 1950s, efforts have been going on to erect a barrier across Vembanad Lake at a narrow point at Thanneermukkom. This barrier has shutters, which can be closed in summer to prevent sea water from moving in, or raised to drain it out. In addition, a cut has been made in the sandbar separating Vembanad from the sea at Thottappally, southwest of the barrier, to let the excess water behind the shutters empty into the sea during floods (Anon. 1993). In short, every attempt is being made to reclaim more and more land for cultivation.

The lime shell deposit on the floor of the lake is being dredged for the last 40 years, and is the main raw material for two factories in the district (Sreekumar 2001). Dredging has disturbed about 75% of the lake floor. Vembanad Lake is only one of the tourist attractions in Kerala facing increasing threats from tourism. Speedboats and houseboats have increased – hundreds of thousands of migratory ducks that used to congregate here have disappeared due to this disturbance. The natural contours of the lake have given way to granite walls, further reducing the natural habitat for birds (Sreekumar 2001).

Exotic weeds such as *Eichhornia crassipes* **and** *Salvinia adnata* have played havoc in Vembanad-Kuttanad, especially in the shallow areas (Narayanan *et al*. 2011). Till 1990, the KTDC Tourist Complex in Kumarakom, now known as KTDC Waterscapes (previously known as Baker Estate), had long stretch of mangroves. Between 1990 and 1996, 75% of the mangroves were cleared. In the past, the Baker family protected the mangroves, and till the 1980s, about 2,000 Black-crowned Night-heron *Nycticorax nycticorax* used to breed here, along with Oriental Darter, Little Cormorant, Large Egret, Intermediate Egret, Purple Heron, and Indian Pond-heron. KTDC proposed to clear the mangrove patches to build infrastructure for high-end tourism, but the plan was shelved. The Government of Kerala had interest in developing a bird sanctuary in Kumarakom. However, failure to arrive at a consensus between KTDC and the State Forest Department resulted in the bird sanctuary proposal being shelved (Sreekumar 2002).

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ASAD R. RAHMANI

Vembanad-Kole is a Ramsar site and a tourist destination famous for its backwaters. It also attracts more than 20,000 waterfowl and many threatened species

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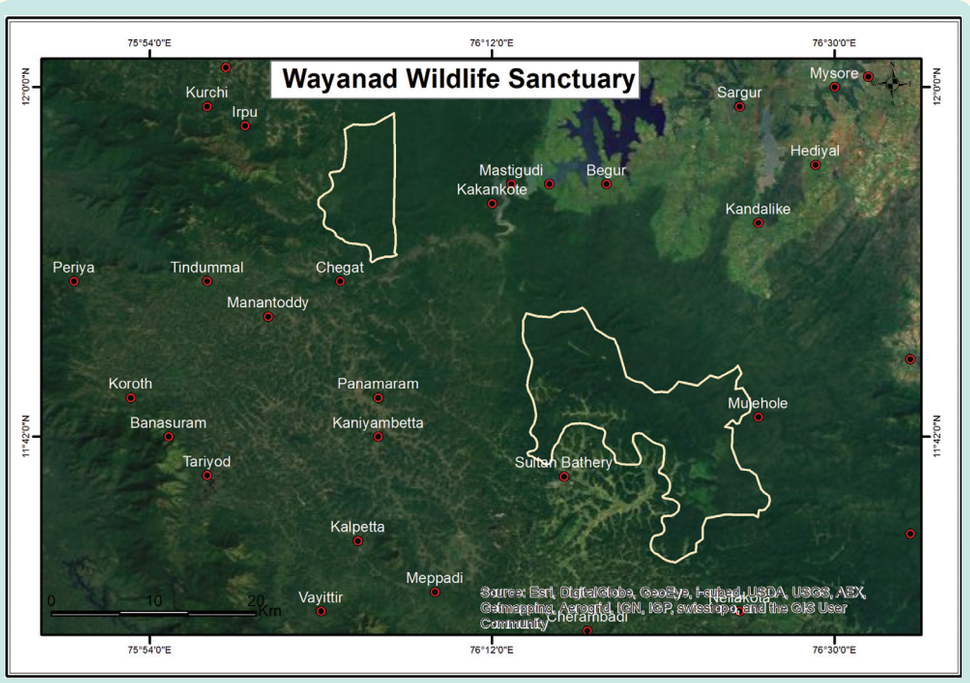
WAYANAD WILDLIFE SANCTUARY

IN-KL-24

IBA Site	: IN-KL-24		**Rainfall**	:	2,000 mm
Administrative Region (State)	: Kerala		**Temperature**	:	13 ºC to 32 ºC
District	: Wayanad		**Biogeographic Zone**	:	Western Ghats
Coordinates	: 11º 54' 28" N, 76º 04' 36" E		**Habitats**	:	Tropical Semi-evergreen, Tropical Moist Deciduous, and Tropical Dry Deciduous Forests, Bamboo brakes
Ownership	: State				
Area	: 34,444 ha				
Altitude	: 640–1,158 msl				

IBA CRITERIA: A1 (Threatened species), A2 (Endemic Bird Area 123: Western Ghats), A3 (Biome 10: Indian Peninsula Tropical Moist Forest)

PROTECTION STATUS: Wildlife Sanctuary, established May, 1973.



GENERAL DESCRIPTION

Wayanad derives its name from its numerous swamps (locally called *vayal*s). Wayanad Wildlife Sanctuary is situated contiguous to the protected area network comprising Nagarhole National Park and Bandipur Tiger Reserve (Karnataka) to its northeast and Mudumalai Wildlife Sanctuary (Tamil Nadu) to the southeast. The area falls in Wayanad revenue district of Kerala as two discontinuous segments. The northern segment is the Tholpetty Wildlife Range in Manantoddy *taluka*, adjacent to Nagarhole NP. The southern segment comprises Kurichiat, Sultan's Battery, and Muthanga Wildlife Ranges, adjacent to Bandipur TR and Mudumalai WLS. The total area measures 34,444 ha.

A wide area of cultivation separates the two segments. There are extensive plantations and several cultivated enclosures within the sanctuary, constituting the major portion of the sanctuary. Wayanad region is a westward extension of the Deccan Plateau, bounded by Coorg and Mysore to the north and east, Nilgiris to the south, and Mallapuram and Calicut to the southwest. The Ghats section is separated by the Brahmagiri-Dindimal ranges. The average altitude of the plateau is 700 m, but many peaks exceed 1,500 m. Kabini, the only river, originates in the Western Ghats and flows eastwards (Zacharias & Gaston 1993).

Wayanad Wildlife Sanctuary forms the western part of the Nilgiri Biosphere Reserve. Wayanad is considered to be one of the most important wildlife sanctuaries of the Western Ghats. The sanctuary was declared in 1973, but is being protected effectively only after bringing it under the Wayanad Wildlife Division, formed in 1985.

The migratory paths of terrestrial wildlife of Nilgiri Biosphere Reserve end at Wayanad WLS in the northwest portion. Hence this forest is significant from the conservation point of view. Wayanad receives more rain than the adjacent tracts in Karnataka and Tamil Nadu. This results in the annual mass movement of major herbivores to the Wayanad area during the lean period. Hence, it is all the more important that Wayanad forest should be adequately protected.

Moist Deciduous Forest is the climax vegetation of the area, occurring in areas with an annual rainfall of 1,100–1,900 mm. Except along the western edges and in a few other pockets, climatic conditions do not favour the formation of climax evergreen vegetation. Despite the removal of Teak *Tectona grandis*, two Moist Deciduous Forest subtypes are still discernible: forests with and without Teak in areas of lower and higher rainfall, respectively. Where Teak is predominant, the forest generally attains a height of *c.* 20 m and the canopy is more or less closed; the soil is reddish and deep, and typically supports a thin herbaceous cover. The marshes have lush growth of grasses and good growth of Bamboo *Bambusa arundinacea* occurs along their edges. Nair *et al.* (1978) provide a detailed description of the vegetation, with lists of common tree, shrub, climber, and grass species.

CRITICALLY ENDANGERED	
White-rumped Vulture	*Gyps bengalensis*
Long-billed Vulture	*Gyps indicus*
Red-headed Vulture	*Aegypius calvus*
VULNERABLE	
Lesser Adjutant	*Leptoptilos javanicus*
Asian Woollyneck	*Ciconia episcopus*
Nilgiri Wood-pigeon	*Columba elphinstonii*
NEAR THREATENED	
Oriental Darter	*Anhinga melanogaster*
Grey-headed Fish-eagle	*Ichthyophaga ichthyaetus*
Lesser Fish-eagle	*Ichthyophaga humilis*
Pallid Harrier	*Circus macrourus*
Nilgiri Flycatcher	*Eumyias albicaudata*
Malabar Pied Hornbill	*Anthracoceros coronatus*
Grey-headed Bulbul	*Microtarsus priocephalus*
ENDEMIC BIRD AREA 123: WESTERN GHATS	
Nilgiri Wood-pigeon	*Columba elphinstonii*
Malabar Parakeet	*Psittacula columboides*
Malabar Grey Hornbill	*Ocyceros griseus*
Grey-headed Bulbul	*Microtarsus priocephalus*
Wynaad Laughingthrush	*Garrulax delesserti*
Indian Rufous Babbler	*Turdoides subrufus*
Nilgiri Flycatcher	*Eumyias albicaudata*
White-bellied Blue Flycatcher	*Cyornis pallipes*
Small Sunbird	*Leptocoma minima*
White-bellied Treepie	*Dendrocitta leucogastra*
BIOME 10: INDIAN PENINSULA TROPICAL MOIST FOREST	
Blue-faced Malkoha	*Phaenicophaeus viridirostris*
Sri Lanka Frogmouth	*Batrachostomus moniliger*
Indian Swiftlet	*Collocalia unicolor*
Jerdon's Nightjar	*Caprimulgus atripennis*
Malabar Trogon	*Harpactes fasciatus*
White-cheeked Barbet	*Megalaima viridis*
Malabar Pied Hornbill	*Anthracoceros coronatus*
Malabar Barbet	*Megalaima malabarica*
Malabar Whistling-thrush	*Myophonus horsfieldii*
Hill Swallow	*Hirundo tahitica*
Yellow-browed Bulbul	*Acritillas indica*
Indian Scimitar-babbler	*Pomatorhinus horsfieldii*
Dark-fronted Babbler	*Rhopocichla atriceps*
Loten's Sunbird	*Nectarinia lotenia*
Black-throated Munia	*Lonchura kelaarti*

AVIFAUNA

A total of 275 bird species have been reported from Wayanad district (Zacharias & Gaston 1993), however many of the areas covered are wetter zones which are not part of the wildlife sanctuary. Ten species are endemic to the Western Ghats, and several others have disjunct distribution in the Indian subcontinent. Subsequent bird surveys conducted by the Forest Department and NGOs like Shama Nature Lover's Forum, Warblers and Waders, and Hume's Centre for Ornithology and Wildlife Biology in 1990–91, 1995, 2001, 2008, and 2014 added several new bird species to the checklist. Uthaman (1993) reported a Lesser Kestrel *Falco naumanni* in December, 1991. Zacharias & Gaston (1993) also listed this species.

Beside restricted-range species, this site also has three Critically Endangered species of vultures including the Red-headed Vulture *Aegypius calvus*. This population is contiguous with its conspecifics in Karnataka and Tamil Nadu, and is the last remaining population in southern India which is solely dependent on carcasses of wild fauna.

Atleast seven Near Threatened species have been recorded, which are listed in the Table. Interestingly, Wayanad is also one of the few protected areas in the Western Ghats where both Grey-headed Fish-eagle *Ichthyophaga ichthyaetus* and Lesser Fish-eagle *I. humilis* occur. One of the remaining populations of Lesser Adjutant *Leptoptilus javanicus* in the Western Ghats occurs here.

BirdLife International (undated) has categorized species according to their biome assemblages. This site falls in Biome 10 (Indian Peninsula Tropical Moist Forest), in which 15 species are considered representative of this biome; all 15 species occur here.

This IBA is also an important wintering site for many forest birds of the temperate and tropical forest zones of the Himalaya.

OTHER KEY FAUNA

Wayanad WLS is famous for its large mammals. Almost all the species of the Western Ghats are seen here, but the

best known are the Asiatic Elephant *Elephas maximus*, Gaur *Bos gaurus*, Nilgiri Langur *Trachypithecus johni*, Tiger *Panthera tigris*, Leopard *P. pardus*, and Indian Wild Dog *Cuon alpinus*. Thomas *et al.* (1997) have recorded 44 species of reptiles, of which 12 are considered to be globally Threatened.

Biju *et al.* (2011) described two new species of night-frogs from Chembra, Thirunelly and Suganthagiri areas in Wayanad district. One was named as *Nyctibatrachus grandis*, wherein species epithet *grandis* is an adjective, meaning large, referring to the largest adult size reported in *Nyctibatrachus* genus. The other was named as *Nyctibatrachus vrijeuni*.

MRUGANK PRABHU

The Endangered *Ghatophryne ornata* (Gunther, 1876) was discovered in the Brahmagiri hills. It also occurs in Kudremukh National Park in Karnataka and Kurichiyarmalai in Wayanad WLS

LAND USE

- Nature conservation and research
- Forestry
- Tourism

THREATS AND CONSERVATION ISSUES

- Firewood collection
- Grazing

The most disturbing feature of Wayanad WLS is the large number of settlements with cultivation. The Southern Ranges have 80 settlements and Tholpetty Range has nine. The settlements in Southern Ranges are confined to the moist deciduous forests. People have occupied almost all the *vayal*s with perennial water sources. More than 25,000 people live in and around this PA. The main occupation is agriculture, for cash crops such as coffee, pepper, and coconut, followed by primary crops paddy, ginger, tapioca, and other plantations. Electric fencing, provided by the Forest Department, protects a few settlements. A total of 166 km of electric fencing has been erected in the IBA to prevent crop damage by wild animals.

Livestock holdings are confined mostly to goats and cattle. These animals are usually left to graze inside the sanctuary. Cattle lifting by Leopard and Tiger are not uncommon.

KEY CONTRIBUTORS

IBA Team, Praveen J.

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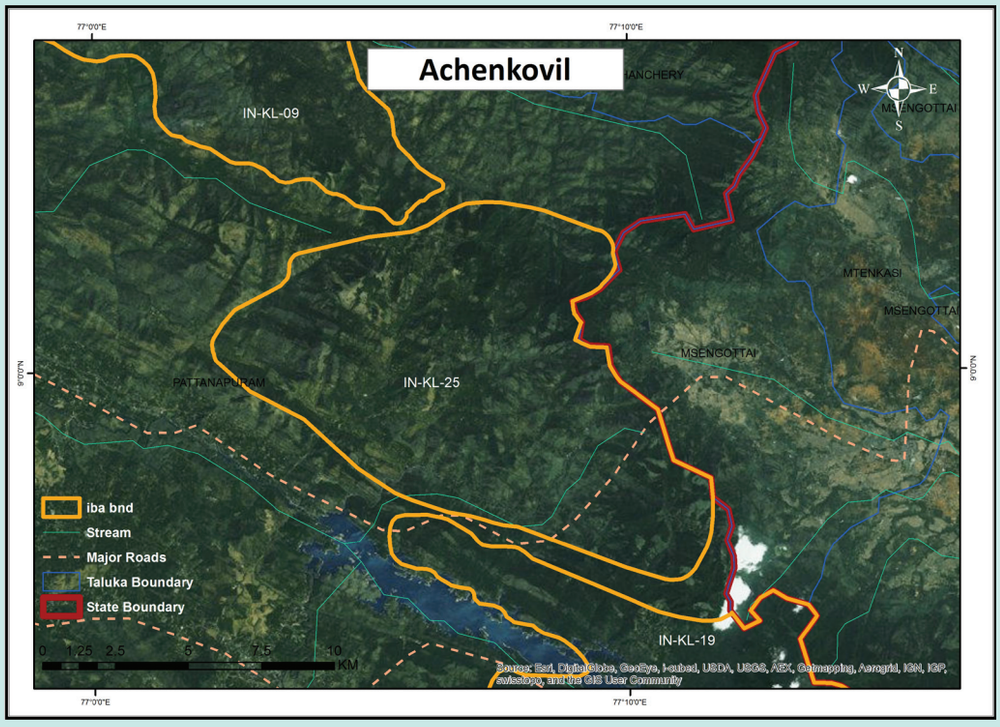
ACHENKOVIL FOREST DIVISION

IBA Site Code	: IN-KL-25	**Altitude**	: *c.* 150–1,923 msl
Administrative Region (State)	: Kerala	**Rainfall**	: 3,500 mm
District	: Kollam	**Temperature**	: 16 ºC to 35 ºC
Coordinates	: 9° 02'–9° 11' N, 77° 03' to 77° 16' E	**Biogeographic Zone**	: Western Ghats
Ownership	: State	**Habitats**	: Southern Tropical Wet Evergreen and, Tropical Semi Evergreen, Tropical Moist Deciduous Forest
Area	: 26,900 ha		

IBA CRITERIA: A1 (Threatened species), A2 (Endemic Bird Area 123: Western Ghats), A3 (Biome 10: Indian Peninsula Tropical Moist Forest)

PROTECTION STATUS: Reserve Forest.



GENERAL DESCRIPTION

Located in the Periyar-Agasthyamalai corridor, the Achenkovil (or Achankovil) Reserve Forest, comprising Tropical Deciduous, Semi-evergreen, and Evergreen forests, is a priority site for conservation in the southern Western Ghats (CEPF 2007). A part of Pandalam Hills (Nair 1991), this forms a vast contiguous stretch of rugged terrain from the southern reaches of Periyar Tiger Reserve, all along the crest line of the Western Ghats and the adjoining high plateau in Ranni forest division which culminates in the Achenkovil forest division before flattening out at the Shengottah Gap. The area is bounded by Tamil Nadu state in the east, Ranni forest division in the northeast, Konni forest division in the west, Punalur forest division in the southwest, and Thenmala forest division in the south (Hosagoudar *et al.* 2010). The region is drained by numerous streams and rivulets, which join Kanayar river and Kallar river before emptying into Achenkovil river. Achenkovil river is formed by confluences with several small streams originating from Pasukida Mettu, Pamakkal Teri, and Rishi Malai at altitudes ranging between 700–1,600 msl. Kanayar river arises in the Western Ghats near Devarmalai at an elevation of 1800 msl and flows 30 km in a generally east to west direction before turning south to join the Achenkovil. Kallar river originates from a ridge that borders stretch of forests at an elevation of 1,200 msl, flows south and joins

Kanayar and then Achenkovil. These riverine stretches have an impressive and unique assemblage of flora and fauna. However, vast stretches of natural forest have been converted to Teak plantations in the past century.

This area forms part of the Western Ghats immediately north of the Shengottah Gap. The forest zone comes under Kallar Range (7,800 ha), Kanayar Range (10,700 ha) and Achenkovil Range (8,400 ha).

The altitude of Achenkovil forests ranges between *c.* 150–1,923 m, the latter being the height of Devarmalai, which is home to several endemic fauna, and limits the southernmost distribution of several taxa.

AVIFAUNA

Achenkovil forest division was hardly visited by naturalists until quite recently and even now the ornithological inventory is far from complete. Praveen & Nameer (2009) consider this as a gap in their coverage of bird surveys, while Sashikumar *et al.* (2011a) do not have any information from this forest patch. As part of their Travancore-Cochin survey, Sashikumar *et al.* (2011b) covered a single transect in these forests but did not list any significant findings.

In December, 2009, a concerted bird survey organized by KeralaBirder and College of Forestry, Kerala Agricultural University, Thrissur identified 160 species of birds from eight base stations spread across all habitats and altitudes, which include 10 species endemic to Western Ghats (unpublished). Kalesh *et al.* (2010) reported 96 species during a rapid biodiversity assessment organized by Travancore Natural History Society (TNHS) spanning three days. Visits since then by TNHS to Devarmalai have reported a few more threatened species (Sandeep Das, *pers. comm.* 2014) which includes the Endangered White-bellied Blue Robin *Myiomela albiventris*, multiple sightings of Black-and-Orange Flycatcher *Fecidula nigrorufa* and Nilgiri Thrush *Zoothera neilgherriensis*. Devarmalai forms the southerly distribution of the Palni Laughingthrush *Strophocincla fairbanki*. In summary, one Endangered, one Vulnerable, eight Near Threatened species apart from 13 of the 26 Western Ghats endemic species and 10 of the 15 biome- restricted species belonging to Biome 10 have been reported here.

The lower altitude regions of these forests house an excellent population of the Near Threatened Grey-headed Bulbul *Pycnonotus priocephalus* which prefers the edges of streams. The Vulnerable peninsular endemic Yellow-throated Bulbul *Pycnonotus xantholaemus* has also been observed from the eastern slopes of these hills in Tamil Nadu by Sandeep Das, and this forms the southernmost distribution for this species.

OTHER KEY FAUNA

There have not been many faunistic studies in Achenkovil Forest Division. This area is contiguous with Periyar Tiger Reserve and Ranni forest division which have an excellent population of large mammals, including Asiatic Elephant *Elephas maximus*. Kalesh *et al.* (2010) reported twelve species of reptiles, 119 species of butterflies, and four species of amphibians during a rapid biodiversity assessment by TNHS. They found that the riparian stretches were a good habitat for Odonates, of which 33 species were recorded. The presence of 13 species of mammals was noted, including Lion-tailed Macaque *Macaca silenus* and Nilgiri Langur *Semnopithecus johnii*. The fish population observed was phenomenal, and a total of 11 species were recorded, including the endemic and Threatened *Puntius denisonii*. Later, 46 species of freshwater fishes were reported in a study from Achenkovil RF, including 14 species endemic to the Western Ghats (Baby *et al.* 2011).

ENDANGERED	
White-bellied Blue Robin	*Myiomela albiventris*
VULNERABLE	
Nilgiri Wood-pigeon	*Columba elphinstonii*
NEAR THREATENED	
Oriental Darter	*Anhinga melanogaster*
Pallid Harrier	*Circus macrourus*
Great Pied Hornbill	*Buceros bicornis*
Grey-headed Bulbul	*Microtarsus priocephalus*
Kerala Laughingthrush	*Strophocincla fairbanki*
Tytler's Leaf-warbler	*Phylloscopus tytleri*
Black-and-Orange Flycatcher	*Ficedula nigrorufa*
Nilgiri Flycatcher	*Eumyias albicaudatus*
ENDEMIC BIRD AREA 123: WESTERN GHATS	
Nilgiri Wood-pigeon	*Columba elphinstonii*
Malabar Parakeet	*Psittacula columboides*
Malabar Grey Hornbill	*Ocyceros griseus*
White-bellied Blue Robin	*Myiomela albiventris*
Grey-headed Bulbul	*Microtarsus priocephalus*
Wynaad Laughingthrush	*Garrulax delesserti*
Kerala Laughingthrush	*Strophocincla fairbanki*
Rufous Babbler	*Turdoides subrufus*
Black-and-Orange Flycatcher	*Ficedula nigrorufa*
Nilgiri Flycatcher	*Eumyias albicaudatus*
White-bellied Blue Flycatcher	*Cyornis pallipes*
Small Sunbird	*Leptocoma minima*
White-bellied Treepie	*Dendrocitta leucogastra*
BIOME 10 INDIAN PENINSULA TROPICAL MOIST FOREST	
Indian Swiftlet	*Aerodramus unicolor*
Malabar Trogon	*Harpactes fasciatus*
White-cheeked Barbet	*Megalaima viridis*
Crimson-fronted Barbet	*Megalaima rubricapilla*
Yellow-browed Bulbul	*Acritillas indica*
Malabar Whistling-thrush	*Myophonus horsfieldii*
Dark-fronted Babbler	*Rhopocichla atriceps*
Indian Scimitar-babbler	*Pomatorhinus horsfieldii*
Loten's Sunbird	*Nectarinia lotenia*
Black-throated Munia	*Lonchura kelaarti*

LAND USE

- Forestry
- Tourism

THREAT AND CONSERVATION ISSUES

- Tourism
- Forestry activities
- Firewood collection
- Forest fires

The forests of Achenkovil RF are subject to multiple forestry activities, including selective felling, *Ochlandra* harvesting, Teak plantations, and minor forest produce collection. These activities are carried out regardless of their impact on wildlife, and most often during the peak breeding season of avifauna. This need to be streamlined so that the habitat is not over-exploited.

Achenkovil Dharmasastha temple which is managed by the Travancore Devaswom Board is a religious destination with an ever-growing number of devotees. This arterial road through lowland forests is sometimes used by tourists who visit Sabarimala, when they take a break at Achenkovil temple. There are growing demands from the temple township of Achenkovil to improve the infrastructure of the access road, which would increase vehicular traffic. This would increase the biotic pressure on the neighbouring forests.

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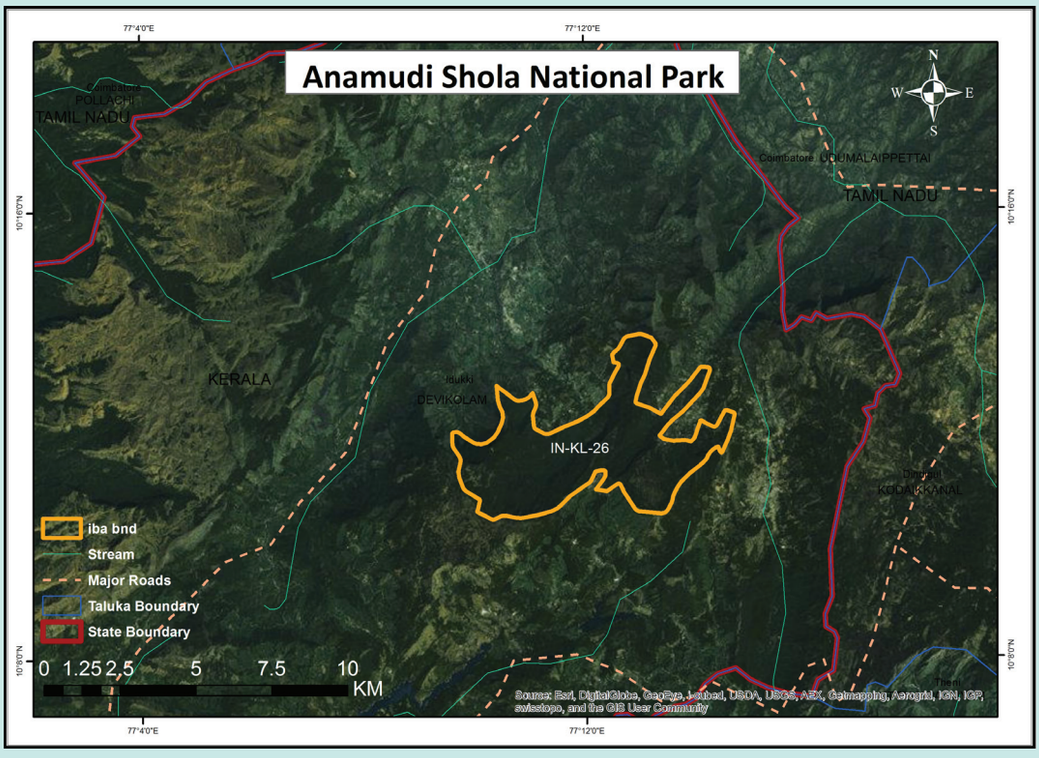
ANAMUDI SHOLA NATIONAL PARK

IN-KL-26

IBA Site Code	: IN-KL-26	**Rainfall**	: 2,000–2,500 mm
Administrative Region (State)	: Kerala	**Temperature**	: 9.5 °C (December) to 30 °C (April)
District	: Idukki	**Biogeographic Zone**	: Western Ghats
Coordinates	: 10° 10′ 00″ to 10° 12′ 18″ N, 77° 09′ 50″ to 77° 12′ 18″ E	**Habitats**	: Southern Montane Wet Temperate Forest (Shola), Southern Sub-tropical Broadleaf Hill Forest, Southern Tropical Moist Deciduous Forest, Southern Montane Wet Temperate Grassland.
Ownership	: State		
Area	: 7.5 sq. km		
Altitude	: 1,600–2,200 msl		

IBA CRITERIA: A1 (Threatened species), A2 (Endemic Bird Area 123: Western Ghats), A3 (Biome 10: Indian Peninsula Tropical Moist Forest)

PROTECTION STATUS: National Park, established 2003.



GENERAL DESCRIPTION

Anamudi Shola National Park was declared in 2003. It consists of three Shola Reserve Forests, namely Mannavan Shola, Pullaradi Shola, and Idivara Shola, and has an area of 7.5 sq. km. Anamudi Shola is part of Munnar Hills in Idukki district, Kerala. The altitude ranges from 1,600 m to 2,200 m. The summit is at Methappu (2,200 m), 7 km from the eastern boundary in Kanthallur of Maryaur Reserve Forest. The forest is a continuous patch from 1,600 m to 2,100 m, above which it is seen in small patches (Wildlife Warden 2012, Swarupanandan *et al*. 1998).

The vegetation is predominantly shola forests. There is a plantation of Black Wattle *Acacia melanoxylon* adjacent to the eastern boundary of the sholas, established in the 1950s. The plantation was raised by the Kerala Forest Department by converting grassland. Within the shola, there was an attempt to establish a Eucalyptus plantation, the remnants of which are present in an area of 0.5 ha.

The Muthuva tribals are inhabitants of this region. The major tribal pockets are at Gudalar situated along the northwestern border of Mannavan Shola and at Kulachivayal, situated north of the shola. Perumala,

ENDANGERED	
White-bellied Blue Robin	*Myiomela albiventris*
VULNERABLE	
Nilgiri Wood-pigeon	*Columba elphinstonii*
Nilgiri Pipit	*Anthus nilghiriensis*
NEAR THREATENED	
Kerala Laughingthrush	*Strophocincla fairbanki*
Tytler's Leaf-warbler	*Phylloscopus tytleri*
Black-and-Orange Flycatcher	*Ficedula nigrorufa*
Nilgiri Flycatcher	*Eumyias albicaudatus*
ENDEMIC BIRD AREA 123: WESTERN GHATS	
Nilgiri Wood-pigeon	*Columba elphinstonii*
Nilgiri Pipit	*Anthus nilghiriensis*
White-bellied Blue Robin	*Myiomela albiventris*
Kerala Laughingthrush	*Strophocincla fairbanki*
Black-and-Orange Flycatcher	*Ficedula nigrorufa*
Nilgiri Flycatcher	*Eumyias albicaudatus*
Small Sunbird	*Leptocoma minima*
BIOME 10 INDIAN PENINSULA TROPICAL MOIST FOREST	
Indian Swiftlet	*Aerodramus unicolor*
Malabar Trogon	*Harpactes fasciatus*
White-cheeked Barbet	*Megalaima viridis*
Hill Swallow	*Hirundo domicola*
Yellow-browed Bulbul	*Acritillas indica*
Malabar Whistling-thrush	*Myophonus horsfieldii*
Indian Scimitar-babbler	*Pomatorhinus horsfieldii*

Kanthallur, and Puthur on the outskirts of the shola are inhabited by Tamilian populations. The people of these habitations are wholly dependent on Mannavan Shola for firewood and timber for construction and agricultural purposes. Agriculture, especially horticulture (temperate fruits and winter vegetables), is the major occupation of the people (Swarupanandan *et al*. 1998).

AVIFAUNA

The birds of Mannavan Shola were studied by Nameer (2000), who reported 41 species from the shola forests. The 10 most common species were Palni Laughingthrush, Grey-headed Canary-flycatcher *Culicicapa ceylonensis*, Greenish Leaf-warbler *Phylloscopus trochiloides*, White-eye *Zosterops palpebrosus*, Velvet-fronted Nuthatch *Sitta frontalis*, Black-and-Orange Flycatcher *Ficedula nigrorufa*, Brown-cheeked Fulvetta *Acippe poioicephala*, Nilgiri Flycatcher, Malabar Whistling-thrush, and Yellow-browed Bulbul. In December, 2012, a bird survey was jointly organized by KeralaBirder, Centre for Wildlife Studies, KAU, Indian Bird Conservation Network-Kerala, and the Kerala State Forest Department in the various protected areas of Munnar Hills. One of the base camps was at Methappu in the Anamudi Shola NP, where 40 species were recorded (Praveen & Nameer 2013).

OTHER KEY FAUNA

No studies have been done on any of the taxa at Anamudi Shola NP. The mammals opportunistically recorded are Indian Giant Squirrel *Ratufa indica*, Nilgiri Langur *Semnopithecus johnii*, Dhole *Cuon alpinus*, Tiger *Panthera tigris*, Leopard *P. pardus*, Sambar *Rusa unicolor*, Gaur *Bos gaurus*, and Asiatic Elephant *Elephas maximus*.

LAND USE

- Forestry
- Tourism

THREATS AND CONSERVATION ISSUES

- Wattle and Eucalyptus plantation
- Tourism
- Forest fire
- Road building

A vast area within the national park is covered with plantations of Black Wattle and Eucalyptus. This has considerably affected the quality of the habitat in Anamudi Shola NP. There is imminent tourism pressure on this IBA, owing to its proximity to Munnar region. Tourism in this region should be regulated according to its carrying capacity, which needs to be studied. A road that passes through the national park is a cause of conservation concern, and the maintenance of this road should be carried out only after conducting appropriate EIA studies.

KEY CONTRIBUTOR

P.O. Nameer

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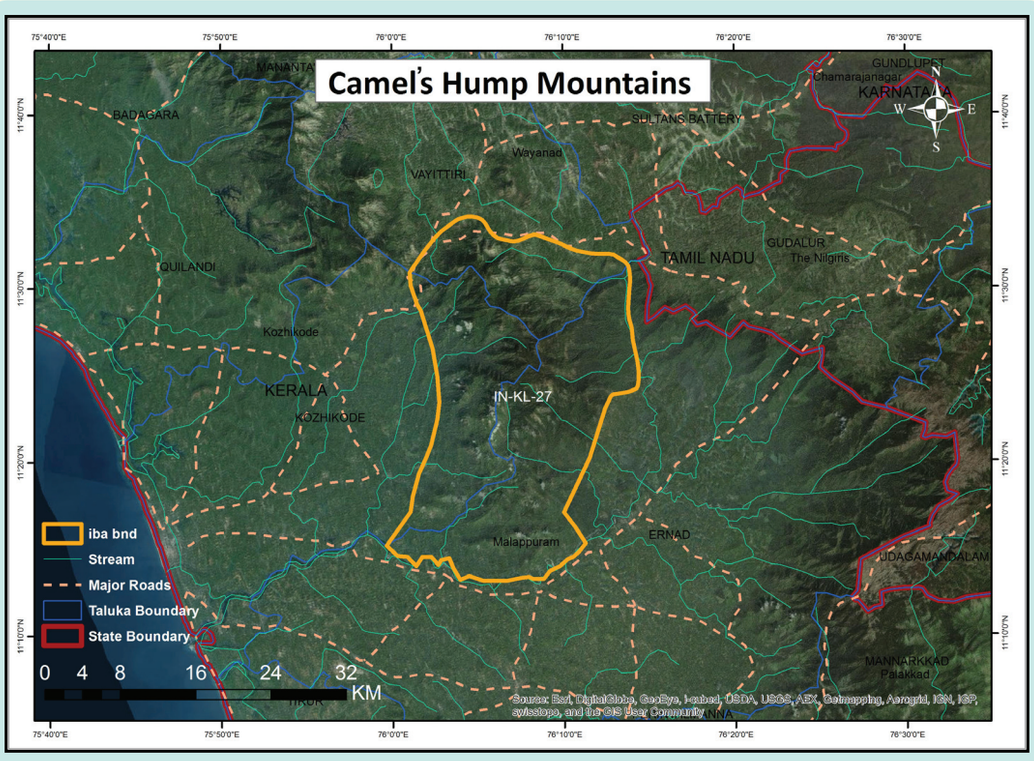
CAMEL'S HUMP MOUNTAINS

IN-KL-27

IBA Site Code	:	IN-KL-27	**Altitude**	:	100–2,339 msl
Administrative Region (State)	:	Kerala	**Rainfall**	:	2,000–5,000 mm
District	:	Wayanad, Kozhikode, Malappuram	**Temperature**	:	0 to 29 °C
Coordinates	:	76.00 to 76.150 E, 11.200 to 11.350 N	**Biogeographic Zone**	:	Western Ghats
Ownership	:	State	**Habitats**	:	West Coast Tropical Wet Evergreen Forest, West Coast Semi-evergreen Forest, Southern Hill Top Evergreen Forest grasses and rocks.
Area	:	370 sq. km			

IBA CRITERIA: A1 (Threatened species), A2 (Endemic Bird Area 123: Western Ghats), A3 (Biome 10: Indian Peninsula Tropical Moist Forest)

PROTECTION STATUS: Deemed Reserve Forests



GENERAL DESCRIPTION

The Camel's Hump Mountains are a unique mountain range aligned in the east-west direction, north of the Nilgiris in the South Wayanad Hills. This IBA site includes mainly the vested forests of Meppady Range (90 sq. km) of South Wayanad Division, Nilambur (119 sq. km), and Edavanna (62 sq. km) Ranges of Nilambur North Division, and the vested forests of Thamarassery Range (99 sq. km) of Kozhikode Division. The Chaliyar river separates these mountains from the Nilgiris. Camel's Hump Mountains start from the hills east of Lakkidi Gap in Wayanad, and continue eastwards, including high peaks such as Chembra, Elambileri, Aranamala, Kattimattam, Vellarimala, and Vavulmala. Nair (1991) pointed out that "... on the south-western edge of Wayanad, on the Camel's Hump Mountains, there are a number of peaks going up above 1500 meters and some up to 2000 meters. Inaccessibility has helped to preserve comparatively more unmodified forest vegetation in this ridge than anywhere else mentioned until now." At the easternmost end of the mountains, the altitude drops to 600 m along the Chaliyar river. There are several peaks in the range reaching above 2,000 msl. The highest is Vavul Peak (Kurathimala) at the border between Nilambur North and South Wayanad divisions, at 2,339 msl. Chembra (1,850 msl) and Elambileri (2,100 msl) are the other high peaks in the range.

The western boundary of the Camel's Hump Mountains starts where Calicut-Mysore road cuts the inter-district boundary of Wayanad and Kozhikode at Lakkidi, passes through the vested forest boundary of Thamarassery range and continues along the vested forest boundaries of Edavanna Range. The southern boundary starts at the point of inter- range boundary of Thamarassery vested forests and the vested forests of Edavanna range proceeds along the boundary of vested forests of Edavanna Range and up to the boundary of Nilambur Range. The eastern boundary starts at the inter-range boundary of Edavanna and Nilambur and proceeds along the vested forest boundary of Nilambur Range, joins the Chaliyar river and proceeds northward up to the point of boundary of Nilambur North and South Wayanad Divisions along the Chaliyar river. From there, it goes along the inter-division boundary up to the state boundary with Tamil Nadu. The northern boundary starts from Lakkidi at Calicut-Mysore road, proceeds clockwise along the boundary of vested forests of Meppady range along the foothills of Chembra, Elambileri, Thollayiram, Mundakkai up to the interstate border with Tamilnadu.

ENDANGERED	
Black-chinned Laughingthrush	*Strophocincla cachinnans*
Nilgiri Blue Robin	*Myiomela major*
VULNERABLE	
Nilgiri Wood-pigeon	*Columba elphinstonii*
Indian Broad-tailed Grass-warbler	*Schoenicola platyura*
NEAR THREATENED	
Oriental Darter	*Anhinga melanogaster*
Great Pied Hornbill	*Buceros bicornis*
Grey-headed Bulbul	*Microtarsus priocephalus*
Tytler's Leaf-warbler	*Phylloscopus tytleri*
Black-and-Orange Flycatcher	*Ficedula nigrorufa*
Nilgiri Flycatcher	*Eumyias albicaudatus*
ENDEMIC BIRD AREA 123: WESTERN GHATS	
Nilgiri Wood-pigeon	*Columba elphinstonii*
Malabar Parakeet	*Psittacula columboides*
Malabar Grey Hornbill	*Ocyceros griseus*
Nilgiri Blue Robin	*Myiomela major*
Grey-headed Bulbul	*Microtarsus priocephalus*
Wynaad Laughingthrush	*Garrulax delesserti*
Black-chinned Laughingthrush	*Strophocincla cachinnans*
Rufous Babbler	*Turdoides subrufus*
Indian Broad-tailed Grass-warbler	*Schoenicola platyura*
Black-and-Orange Flycatcher	*Ficedula nigrorufa*
Nilgiri Flycatcher	*Eumyias albicaudatus*
White-bellied Blue Flycatcher	*Cyornis pallipes*
Small Sunbird	*Leptocoma minima*
White-bellied Treepie	*Dendrocitta leucogastra*
BIOME 10 INDIAN PENINSULA TROPICAL MOIST FOREST	
Jerdon's Nightjar	*Caprimulgus atripennis*
Indian Swiftlet	*Aedrodamus unicolor*
Malabar Trogon	*Harpactes fasciatus*
White-cheeked Barbet	*Megalaima viridis*
Malabar Barbet	*Megalaima malabarica*
Hill Swallow	*Hirundo domicola*
Yellow-browed Bulbul	*Iole indica*
Malabar Whistling-thrush	*Myophonus horsfieldii*
Dark-fronted Babbler	*Rhopocichla atriceps*
Indian Scimitar-babbler	*Pomatorhinus horsfieldii*
Black-throated Munia	*Lonchura kelaarti*

Camel's Hump Mountains are the primary catchment of the River Chaliyar. The west facing mountains receive 3,000 to 5,000 mm rainfall annually. River Chaliyar originates from Elambileri ridge in South Wayanad and flows in a south westerly direction to Nilambur Valley. Aranapuzha that drains the Mundakkai Section, Vellarimalapuzha that drains the Muppainad area, and Kalladipuzha that drains the Chulika Malavaram, are three rivulets that join the Chaliyar in Wayanad region. Muthappanpuzha, Kaniyatpuzha, Iruvanjipuzha, and Chalipuzha are tributaries originating from the Thamarassery range of the Ghats and joining the Chaliyar.

FLORA

Camel's Hump Mountains are bestowed with a variety of forest types:

West Coast Tropical Wet Evergreen Forest (IA/C4): Evergreen forests cover a major part of the IBA from 250 m to 1,200 m. Nilambur Range, the lower portions of Chembra, Mundakkayi, Thiruvampady, and Kodencheri block in Thamarassery Range are covered with Tropical Evergreen forests. Dominant species are *Palaquium ellipticum*, *Artocarpus hirsuta*, *Cullenia exarillata*, *Elaeocarpus tuberculatus*, *Vateria indica*, *Calophyllum elatum*, *Mesua ferrea*, and *Garcinia morella*.

West Coast Semi-evergreen Forest (2A/C2): Semi-evergreen forest is seen in Thiruvambady and Kodenchery blocks of Thamarassery Range, and some parts of Edvanna and Nilambur ranges. Dominant species in this segment are *Lagerstroemia lanceolata*, *Dalbergia latifolia*, *Pterocarpus marsupium*, *Machilus macrantha*, *Sterculia guttata*, *Ficus* sp., *Macaranga peltata*, and *Garcinia gummigutta*.

Southern Hill Top Evergreen Forest (8A/C1/DS1): This type of forest is floristically rich. Although species like *Calophyllum* are found here, they grow crooked and erratic, with a spreading crown. The trees, seldom exceeding 20 m, are heavily ornamented with mosses, lichens, aroids, and ferns. *Syzygium arnottianum*, *Bassia elliptica*, *Fagara lunu-ankenda*, *Mesua ferrea*, *Palaquium ellipticum*, *Calophyllum elatum*, *Litsea stocksii*, and *Cinnamomum zeylanicum* are found in this forest.

Grasses and rock: About 8 sq. km in the Chembra-Elambileri region are grasslands and rocks, starting from 1,500 m and rising to 1,900 m. Beyond Chembra peak there is a small shola + grassland complex. At other higher elevations, Camel's Hump Mountains are characterized by large rocky patches and stunted forest. Kattimattom area

(1,900 m) has vast rocky outcrops, which are home to numerous ground orchids.

CLEMENT FRANCIS

A good population of Nilgiri Blue Robin *Myiomela major* is found in this IBA

AVIFAUNA

Ornithologically, these forests are unexplored except for an expedition conducted in 2007 in the south Wayanad mountains (Vishnudas 2008), which recorded 140 species from the region. Due to its rugged terrain and inaccessible mountain peaks, very few ornithological explorations have been held in the region. The 2007 exploration which covered three locations in the higher elevations of Camel's Hump Mountains revealed a good population of Endangered Black-chinned Laughingthrush (Banasura Laughingthrush) *Strophocincla cachinnans* (Vishnudas 2008). Though the species is reported from Banasura mountains and the Brahmagiris, the largest population resides in Camel's Hump. A total of 100 birds were observed during the survey, with an encounter rate of 34 birds/10 hrs. The bird has been partial to altitudes above *c.*1,600 m. Praveen & Nameer (2012) suggested that this race, if accorded full species status, could be considered as Critically Endangered, as it has a small geographical range (<57 sq. km). At *c.* 1,800 m and above, Black-chinned Laughingthrush are common and could be sighted easily. Till now 14 Western Ghat endemics, have been reported from the Camel's Hump Mountains.

Sashikumar *et al.* (2012), who covered this area during the Malabar Bird Survey, recorded Black-chinned Laughingthrush (Banasura Laughingthrush) at an encounter rate of 26 birds/10 hrs from shola forests of the Vellarimala and Chembra mountains. Fourteen species of raptors were also recorded in the region. During a recent expedition, Vishnudas (2013) captured and released 15 Nilgiri Blue Robin *Myiomela major*, four Nilgiri Thrush *Zoothera neilgherriensis*, 12 Black-chinned Laughingthrush, and four Black-and-Orange Flycatcher from a three hectare plot, showing the abundance of endemics in the region.

Among Vulnerable species, Indian Broad-tailed Grass-warbler *Schoenicola platyura* and Nilgiri Wood-pigeon *Columba elphinstonii* are also recorded in the region. Indian Broad-tailed Grass-warbler frequented the grassy slopes of Chembra peak.

Amongst the Near Threatened category, Nilgiri Flycatcher *Eumyias albicaudatus* is observed in good numbers in the region. Oriental Darter *Anhinga melanogaster* is recorded at a lake on Chembra peak at a height of 1,500 m. Great Pied Hornbill *Buceros bicornis* is occasionally reported from the southern slopes of Chembra. Black-and-Orange Flycatcher *Ficedula nigrorufa* occurs from 1,200 m upward in the sholas and higher limits of evergreen forests. The endemic Wynaad Laughingthrush *Garrulax delesserti* is also observed in the evergreen forests up to 1,300 m.

OTHER KEY FAUNA

Mammals: Mammal diversity is high in the Camel's Hump Mountains. About 41 species of mammals are found in these ranges. They include Asiatic Elephant *Elephas maximus*, Gaur *Bos gaurus*, Tiger *Panthera tigris*, Leopard *P. pardus*, Jungle Cat *Felis chaus*, Leopard Cat *Prionailurus benghalensis*, Nilgiri Langur *Presbytis johnii*, Common Mongoose *Herpestes edwardsi*, Indian Giant Flying Squirrel *Petaurista philippensis*, Malabar Giant Squirrel *Ratufa indica*, Indian Porcupine *Hystrix indica*, Barking Deer *Muntacus muntjak*, Brown Palm Civet *Paradoxurus jerdoni*, Palm Civet or Toddy Cat *P. hermaphroditus*, Sloth Bear *Melursus ursinus*, Flying Fox *Pteropus giganteus*, Painted Bat *Kerivoula picta*, and Malabar Spiny Dormouse *Platacanthomys lasiurus* (Sajikumar 2012).

Amphibians: The region is also rich in Amphibians. About 20 frog species are so far identified, including *Raorchestes anili*, *Raorchestes charis*, *Clinotarsus curtipes*, *Nyctibatrachus grandis*, *Micrixalus nudis*, *M. saxicola*, and *Rhacophorus malabaricus* (Sajikumar 2012).

New Species: Seventeen new species of flowering plants have been discovered from the Camel's Hump Mountains recently. Of these, 11 species are already published and six species await publication. One of the new species, *Ceropegia*

manoharii, is a unique high altitude taxon of the milkweed family Asclepiadaceae. It is recognised by its elegant flower with broad greenish white mottled corolla lobes. *Oberonia swaminathanii* is a new addition to family Orchidaceae from these mountains. Another new species is the wild yam *Dioscorea longitubosa* (Sajikumar 2012).

Butterfly diversity of Camel's Hump has not been explored systematically, but random assessment shows nearly 100 species.

LAND USE

Currently, forestry and eco-tourism are the major land uses. There are some old plantations of *Eucalyptus* which are kept for natural regeneration. At present, timber extraction is not going on in the region. Ecotourism is practiced in the Chembra region of Meppady Range. One watch tower and several tourist huts have been built at the fringe area.

THREATS AND CONSERVATION ISSUES

Camel's Hump Mountains forest consists mainly of Vested Forests (Deemed reserves) and Ecologically Fragile Lands (EFL). According to the Kerala Private Forests Vesting and Assignment Act 1971, all vested forests are "Deemed Reserve Forests". They are the absolute property of Government of Kerala, and have been notified under G.O.Ms. no 82055/FS 21/76/AD dt 11-1-1977 and no. 82055/FS 2/76 dt 11-01-1977, and published in Kerala Gazette no. 4 dt 15-01-1977. Before vesting, these forests were mainly private forests (Working Plan, Kozhikode Division, 2011). Since 2003, a total of 1,033 ha has been vested with the government in South Wayanad Division under the Kerala Forest (Vesting & Management of Ecologically Fragile Lands) Act, 2003. About 250 ha of encroachment on forests is also reported in the mountain ranges of South Wayanad division.

Tourism: Trekking is a major tourism activity on Chembra Peak, which receives 30,000 trekkers annually. As a result, the trek paths are being modified into deeper gullies, with heavy erosion on the slopes. This may also lead to heavy landslides in future. Tourism should be regulated in order to conserve the quality of terrain. Closing the destination for two-year periods every five years may be considered, to allow regeneration of natural vegetation. There is unauthorized tourist entry into the remote areas of Vellarimala from the Thamarassery Range. This should be monitored and stopped.

Fire: Fire is a major issue on Chembra Peak. As this peak experiences strong summer winds, fire can spread fast over the entire grasslands and destroy *Strobilanthes* bushes along the shola edges. Frequent fire causes erosion of shallow top soil and the rocks are exposed in many parts. This process, if uncontrolled, will lead to increased "heating effect" in the rocky areas and affect the quality of shola forests in the hill folds.

Encroachment: Encroachment is another major issue in Camel's Hump. About 2,000 encroachments are reported in the Meppady Range of Camel's Hump alone. Apart from this, there are many boundary consolidation issues. Low staff strength and infrastructure worsen the situation. Fragmentation of forests due to plantations in between is yet another factor working against the conservation of the area's biodiversity.

Considering its ecological importance and value as the habitat of a major population of the Banasore Laughingthrush, Vishnudas (2008) and Sashikumar *et al.* (2012) recommended to the Forest Department that the region should be declared as a national park or sanctuary. Sasikumar *et al.* (2012) recorded that "Situation has changed much after 20 years where we could see encroachments even up to 2,000 m. New roads lead to new heights enabling encroachments. Pristine forests were devastated and converted to plantations".

KEY CONTRIBUTOR

C.K. Vishnudas

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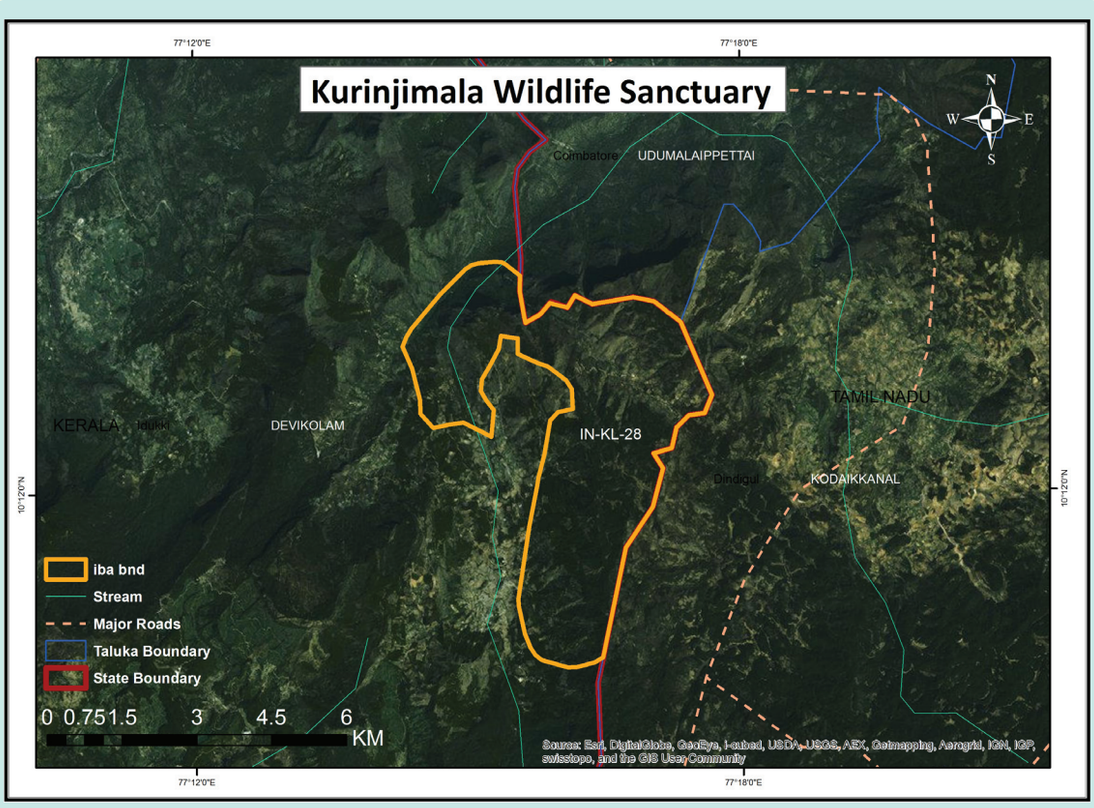
KURINJIMALA WILDLIFE SANCTUARY

IN-KL-28

IBA SITE CODE	:	IN-KL-28	**Rainfall**	:	1,227 mm
Administrative region (State)	:	Kerala	**Temperature**	:	9.5° C to 28 °C
District	:	Idukki	**Biogeographic zone**	:	Western Ghats
Coordinates	:	10° 09' to 10° 13' N; 77° 14' to 77° 17' E	**Habitats**	:	Original vegetation mostly Grassland-Shola, restricted to Kadavari, Kambakkallu). Exotic plantation of Wattle, Pine, and Eucalyptus
Ownership	:	State			
Area	:	3,200 ha			
Altitude	:	1,600 m to 2,400 msl			

IBA CRITERIA: A1 (Threatened species), A2 (Endemic Bird Area 123: Western Ghats), A3 (Biome 10: Indian Peninsula Tropical Moist Forest)

PROTECTION STATUS: Wildlife Sanctuary.



GENERAL DESCRIPTION

Kurinjimala Wildlife Sanctuary was notified on 6th October, 2006 vide GO (MS) NO.36/06/Forest of the Government of Kerala. The sanctuary was declared primarily for the long-term conservation of Neelakurinji *Strobilanthes kunthiana*, which is characterized by purplish blue flowers that bloom once in 12 years. *Strobilanthes kunthiana* belongs to the family Acanthaceae. Kurinjimala is the first protected area of its kind in the state to be declared for the conservation of a flowering plant.

The sanctuary is located on the eastern slopes of the Vattavada Valley in the High Ranges of the Southern Western Ghats, Kerala, and shares its boundary with Kodaikanal Forest Division in Tamil Nadu. The sanctuary is contiguous with Chinnar Wildlife Sanctuary to the north, Manjappetty National Park of Anamalai Tiger Reserve to the north-east, Anamudi Shola National Park to the north-west, Pampadum Shola National Park to the south, and the proposed Palni Hills National Park to the east. It is located 40 km away from Munnar town, Idukki district, Kerala. The

ENDANGERED	
White-bellied Blue Robin	*Myiomela albiventris*
VULNERABLE	
Nilgiri Wood-pigeon	*Columba elphinstonii*
Nilgiri Pipit	*Anthus nilghiriensis*
NEAR THREATENED	
Kerala Laughingthrush	*Strophocincla fairbanki*
Black-and-orange Flycatcher	*Ficedula nigrorufa*
Nilgiri Flycatcher	*Eumyias albicaudatus*
ENDEMIC BIRD AREA 123: WESTERN GHATS	
Nilgiri Wood-pigeon	*Columba elphinstonii*
Nilgiri Pipit	*Anthus nilghiriensis*
White-bellied Blue Robin	*Myiomela albiventris*
Kerala Laughingthrush	*Strophocincla fairbanki*
Black-and-Orange Flycatcher	*Ficedula nigrorufa*
Nilgiri Flycatcher	*Eumyias albicaudatus*
Small Sunbird	*Leptocoma minima*
Grey-headed Bulbul	*Microtarsus priocephalus*
White-cheeked Barbet	*Megalaima viridis*
White-bellied Blue Flycatcher	*Cyornis pallipes*

sanctuary extends over 32 sq. km and the altitude ranges between 1,600–2,400 m.

AVIFAUNA

The first ever bird survey done in Kurinjimala Sanctuary, in December 2012, recorded 51 species of birds (Praveen & Nameer 2013). These included one Endangered, two Vulnerable, and three Near Threatened species, and 10 species that are endemic to the Western Ghats.

The endemic Nilgiri Pipit *Anthus nilghiriensis* was found to be common in the grasslands of the sanctuary, while the Palni Laughingthrush *Strophocincla fairbanki* was common in the shola, shrubs, and edges of the grasslands.The sanctuary also held an excellent population of Black-and-Orange Flycatcher *Ficedula nigrorufa*. On the southern edge of Kurinjimala Sanctuary adjacent to Pampadum Shola National Park, the Olive-backed Pipit *Anthus hodgsoni*, a rare winter visitor to southern Western Ghats, was recorded.

The wattle plantations were generally poor in bird diversity, including primary hole-nesting birds and many of the typical shola-dependent birds were absent. Thus the wattle plantations are a major conservation challenge to Kurinjimala WLS.

OTHER KEY FAUNA

The mammals known from Kurinjimala Wildlife Sanctuary include Asiatic Elephant *Elephas maximus*, Leopard *Panthera pardus*, Wild Dog *Cuon alpinus*, Indian Gaur *Bos gaurus*, Sambar Deer *Rusa unicolor,* arboreal mammals such as Malabar Giant Squirrel, *Ratufa indica, and* Nilgiri Langur *Semnopithecus johnii*, and small carnivores such as the Common Palm Civet *Paradoxurus hermaphroditus.*

LAND USE

- Forestry
- Tourism

THREATS AND CONSERVATION ISSUES

- Forestry activities
- Firewood collection
- Fires

The part of Kurinjimala WLS that borders the Palni hills in the east was notorious for cultivation of *Cannabis*. However, this has come down considerably, if not stopped, after the declaration of the sanctuary.

The Black Wattle *Acacia mearnsii* that was planted extensively on the grasslands prior to the declaration of the sanctuary turned into uncontrolled aggressive growth swamping out the natural vegetation. One of the major management prescriptions in the first Management Plan of the sanctuary is the eradication of wattle in a phased manner.

Other major threats to the sanctuary are firewood collection, grazing, and tourism activities, and ancillary anthropogenic disturbances to the biodiversity of the sanctuary.

KEY CONTRIBUTOR

C.G. Arun

KEY REFERENCES

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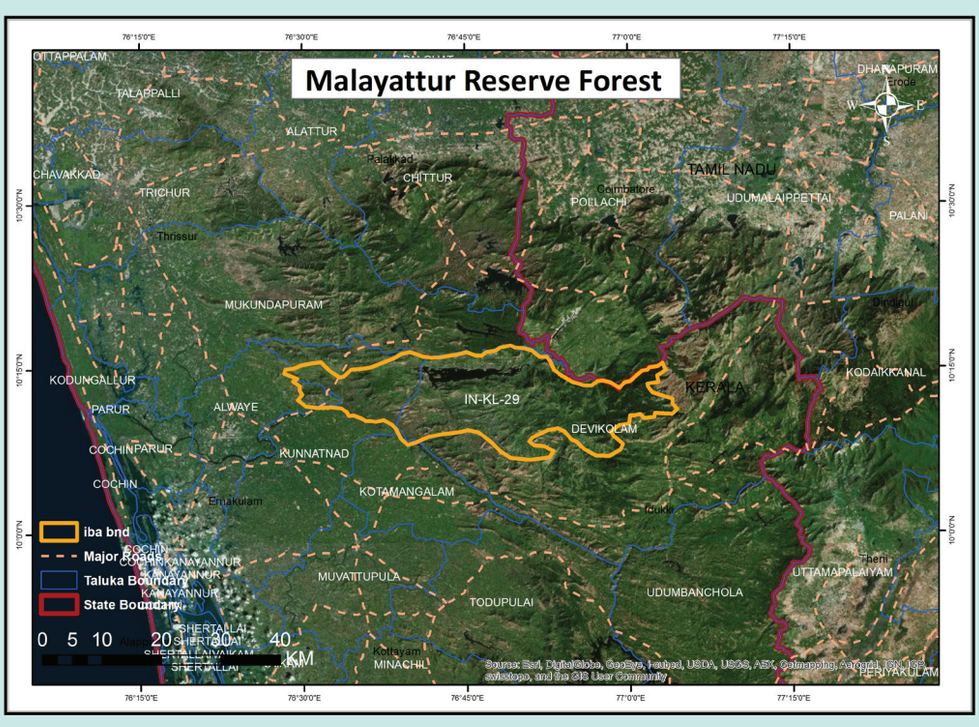
MALAYATTUR RESERVE FOREST

IN-KL-29

IBA Site Code	: IN-KL-29	**Rainfall**	: 3,700 mm
Administrative Region (State)	: Kerala	**Temperature**	: 23° to 33° C
District	: Ernakulam	**Biogeographic Zone**	: Western Ghats
Coordinates	: 10° to 10° 30' N, 76° to 76° 57' E	**Habitats**	: West Coast Tropical Evergreen, West Coast Semi-evergreen, Southern Tropical Moist Deciduous, and Riparian Forests, Plantations
Ownership	: Kerala Forest Department		
Area	: 61,776.59 ha		
Altitude	: 35–1,347 msl		

IBA CRITERIA: A2 (Endemic Bird Area 123: Western Ghats)

PROTECTION STATUS: Reserve Forest. Territorial jurisdiction reorganized with effect from 1.8.1981.



GENERAL DESCRIPTION

Malayattur Forest Division is one of the oldest divisions in Kerala. Malayattur Forest was notified as a reserve forest under Section 18 of the Forest Act in 1895. Sathis Chandran Nair, noted ecologist, records that the 'pockets' of 'Reserved Forests' in the Travancore part were non-agricultural lands which had rich biodiversity and an abundance of resources (Sashikumar *et al*. 2011). The territorial jurisdiction of Malayattur Forest Division was reorganized with effect from August 1, 1981.

The Division was divided into four Ranges, namely Kalady, Kodanad, Thundathil, and Kuttampuzha.

Malayattur FD extends across 61,776 ha, which includes 9,254 ha of plantation area (Anon. 2002). Presently in Malayattur FD, there are 15 reserve forests, Malayattur being the largest. All the RFs except Malayattur Reserve Forest were converted to plantations or assigned for agricultural purposes. The reserve forests of the Division are spread over Aluva, Kunnathunadu, and Kothamangalam *taluk*s of Ernakulam revenue district and Mukundapuram *taluk* of Thrissur district. The major rivers that traverse the area are Idamalayar, Pooyamkutty, and Periyar. These rivers drain the high ranges of Munnar, Chinnar, and the western portions of the adjoining Tamil Nadu forests. Some of the tributaries of these rivers are perennial. The forests of Malayattur Forest Division cover the catchment area of two major dams, namely Bhoothathankettu and Idamalayar.

NEAR THREATENED	
Oriental Darter	*Anhinga melanogaster*
Lesser Fish-eagle	*Ichthyophaga humilis*
Great Pied Hornbill	*Buceros bicornis homrai*
Malabar Pied Hornbill	*Anthracoceros coronatus*
Grey-headed Bulbul	*Microtarsus priocephalus*
Nilgiri Flycatcher	*Eumyias albicaudatus*

ENDEMIC BIRD AREAS 123: WESTERN GHATS	
Malabar Parakeet	*Psittacula columboides*
Malabar Grey Hornbill	*Ocyceros griseus*
Grey-headed Bulbul	*Microtarsus priocephalus*
Wynaad Laughingthrush	*Garrulax delesserti*
Indian Rufous Babbler	*Turdoides subrufus*
Small Sunbird	*Leptocoma minima*
White-bellied Treepie	*Dendrocitta leucogastra*
Nilgiri Flycatcher	*Eumyias albicaudatus*
White-bellied Blue Flycatcher	*Cyornis pallipes*

BIOME 10: INDIAN PENINSULA TROPICAL MOIST FOREST	
Blue-faced Malkoha	*Phaenicophaeus viridirostris*
Sri Lanka Frogmouth	*Batrachostomus moniliger*
Jerdon's Nightjar	*Caprimulgus atripennis*
Indian Swiftlet	*Aerodramus unicolor*
Malabar Trogon	*Harpactes fasciatus*
Malabar Pied Hornbill	*Anthracoceros coronatus*
White-cheeked Barbet	*Megalaima viridis*
Malabar Barbet	*Megalaima malabarica*
Malabar Whistling-thrush	*Myophonus horsfieldii*
Yellow-browed Bulbul	*Acritillas indica*
Indian Scimitar-Babbler	*Pomatorhinus horsfieldii*
Dark-fronted Babbler	*Rhopocichla atriceps*
Loten's Sunbird	*Nectarinia lotenia*

AVIFAUNA

During a study conducted in 1993, 71 species of birds were recorded around Malayattur Kurisumudi. Some interesting species recorded during this study included the Black-winged Kite *Elanus caeruleus*, Black Eagle *Ictinaetus malayensis*, Jungle Bush-quail *Perdicula asiatica*, Brown Fish-owl *Bubo zeylonensis*, Indian Jungle Nightjar *Caprimulgus indicus*, Hoopoe *Upupa epops*, Malabar Grey Hornbill *Tockus griseus*, Lesser Yellow-naped *Picus chlorolophus*, Black-naped Oriole *Oriolus chinensis*, White-bellied Treepie *Dendrocitta leucogastra*, and Small Sunbird *Leptocoma minima* (Nair & Jayson 1993).

The first ever comprehensive bird survey of Malayattur FD was conducted from February 12–14, 2011 jointly by the Cochin Natural History Society, KeralaBirder, and the Kerala Forest Department. A total of 195 species were recorded from this region, which included six Red Data Species listed as Near Threatened by IUCN.

Observers found that the forest supported excellent population of Great Pied Hornbill *Buceros bicornis homrai*, the State Bird of Kerala. The Malabar Pied

HEMANTH JOSHI

The tributaries of Idamalayar, Pooyamkutty, and Periyar traverse Malayattur Forest Division

Hornbill *Anthracoceros coronatus*, which prefers riverine forests, was recorded from Erumukham area. The Near Threatened Lesser Fish-eagle *Ichthyophaga humilis* was recorded from Kappayam and Pooyamkutty areas, apart from Oriental Darter *Anhinga melanogaster*, Nilgiri Flycatcher *Eumyias albicaudatus*, and Grey-headed Bulbul *Pycnonotus priocephalus*. These forests also house nine species which are listed as endemic to the Western Ghats.

Other interesting bird species include Chestnut-winged cuckoo *Clamator coromandus*, Large Hawk-Cuckoo *Hierococcyx sparverioides*, Mountain Hawk-eagle *Nisaetus nipalensis*, Black Baza *Aviceda leuphotes*, Broad-billed Roller *Eurystomus orientalis*, Black-capped Kingfisher *Halcyon pileata*, White-bellied Woodpecker *Dryocopus javensis hodgsonii*, Speckled Piculet *Picumnus innominatus malayorum*, Sri Lanka Frogmouth *Batrachostomus moniliger*, Great Eared-nightjar *Eurostopodus macrotis*, Brown Shrike *Lanius cristatus*, Fork-tailed Drongo-cuckoo *Surniculus lugubris dicruoides*, Spangled Drongo *Dicrurus hottentottus*, and Black Bittern *Ixobrychus flavicollis* (Dilip *et al*. 2011).

DILIP K.G.

The forests of Malayattur Forest Division cover the catchment area of two major dams, namely Bhoothathankettu and Idamalayar

OTHER KEY FAUNA

The wildlife population estimation jointly organized by Kerala Forest Research Institute, Peechi and Kerala Forest Department in 1997 indicated the presence of the following: Nilgiri Langur *Semnopithecus johnii*, Lion-tailed Macaque *Macaca silenus*, Bonnet Macaque *M. radiata*, Asiatic Elephant *Elephas maximus*, Gaur *Bos gaurus*, Sambar Deer *Rusa cervicolor*, Barking Deer *Muntiacus muntjak*, Mouse Deer *Moschiola indica*, Wild Boar *Sus scrofa*, Malabar Giant Squirrel *Ratufa indica*, Indian Porcupine *Hystrix indica*, Sloth Bear *Melursus ursinus*, and Wild Dog *Coun alpinus*.

LAND USE

- Dams
- Plantation
- Pilgrimage
- Tourism

THREAT AND CONSERVATION ISSUES

- Quarrying
- Cattle grazing
- Reed collection
- Human settlements
- Exotic and invasive weeds
- Human-wildlife conflict

KEY CONTRIBUTORS

Dilip K.G., Cochin Natural History Society, J. Praveen, P.O. Nameer.

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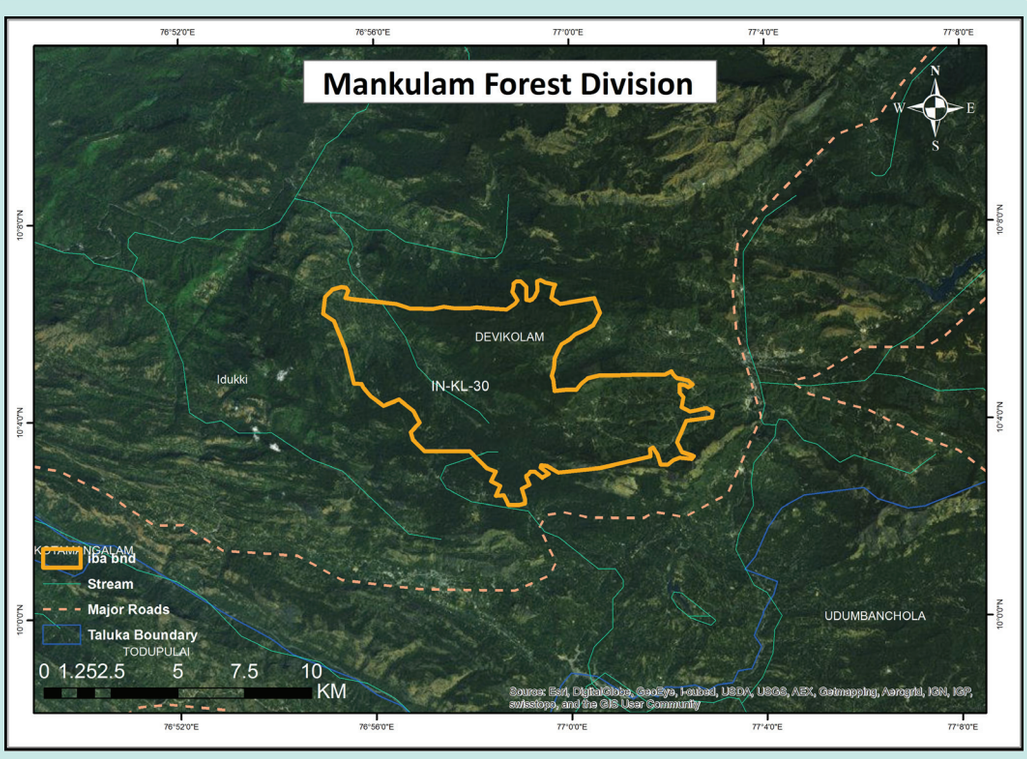
MANKULAM FOREST DIVISION

IBA Site Code	: IN-KL-30	**Altitude**	: 340–1,740 msl
Administrative Region (State)	: Kerala	**Rainfall**	: 2,500 mm to 3,000 mm
District	: Idukki	**Temperature**	: 5˚C to 30˚C
Coordinates	: 10˚ 0' to 10˚ 10' N, 76˚ 50' to 77˚ 0' E	**Biogeographic Zone**	: Western Ghats
Ownership	: Government	**Habitats**	: West Coast Tropical Evergreen & Semi-evergreen Forests, High Altitude Shola Grasslands, Cardamom plantations
Area	: 9,005.75 ha (excluding assigned lands)		

IBA CRITERIA: A1 (Threatened species), A2 (Endemic Bird Area 123: Western Ghats), A3 (Biome 10: Indian Peninsula Tropical Moist Forest)

PROTECTION STATUS: Reserve forest, established May 16, 2007.



GENERAL DESCRIPTION

Mankulam area was previously part of Kannan Devan Hills village. The area was leased to the British planter John Daniel Munroe by the Poonjar chief in 1877 for tea plantation, which was later ratified by the erstwhile Government of Travancore. A large area of the leased land was not used for plantation by the lease holder and the land was vested with the state government in keeping with the Kannan Devan Hills (Resumption of Lands) Act (1971) decades later. However, several years later, many government schemes such as the Grow More Food programme and rehabilitation of landless agriculturists caused the Mankulam forest area to be cleared partially, and this paved the way for large scale encroachments. Even though efforts were made to clear the area of encroachments, around 5,200 acres were allotted to settlers and encroachers by the Revenue Department. Public litigation and efforts from Kerala Forest Department were needed to put an end to the assignment of lands by the Revenue Department, and in 2007 Mankulam Forest Division was finally formed according to a government order dated May 17, 2007. The division comprised about 9,006 ha of protected land.

ENDANGERED	
White-bellied Blue Robin	*Myiomela albiventris*
VULNERABLE	
Nilgiri Wood-pigeon	*Columba elphinstonii*
Nilgiri Pipit	*Anthus nilghiriensis*
NEAR THREATENED	
Kerala Laughingthrush	*Strophocincla fairbanki*
Tytler's Leaf-warbler	*Phylloscopus tytleri*
Black-and-Orange Flycatcher	*Ficedula nigrorufa*
Nilgiri Flycatcher	*Eumyias albicaudatus*
Grey-headed Bulbul	*Microtarsus priocephalus*
ENDEMIC BIRD AREA 123: WESTERN GHATS	
Nilgiri Wood-pigeon	*Columba elphinstonii*
Malabar Parakeet	*Psittacula columboides*
Nilgiri Pipit	*Anthus nilghiriensis*
Malabar Grey Hornbill	*Ocyceros griseus*
Grey-headed Bulbul	*Microtarsus priocephalus*
White-bellied Blue Robin	*Myiomela albiventris*
Kerala Laughingthrush	*Strophocincla fairbanki*
Indian Rufous Babbler	*Turdoides subrufus*
Black-and-Orange Flycatcher	*Ficedula nigrorufa*
Nilgiri Flycatcher	*Eumyias albicaudatus*
White-bellied Blue Flycatcher	*Cyornis pallipes*
Small Sunbird	*Leptocoma minima*
White-bellied Treepie	*Dendrocitta leucogaster*

Many rivers originate from Mankulam, including Ethashola, Menachery, and Karinthiri. These rivers meet at Anakulam, flowing west to join the Pooyamkutty river, which in turn joins Edamalayar, a tributary of the Periyar river. Periyar is a perennial water source for the people staying downstream all the way to the Arabian Sea. The altitude of the IBA varies between 340 msl and 1,740 msl. The highest peak in the area is Parvathimala, situated in the Mankulam range.

The northern boundary of the reserve forest runs along the southern boundary of Munnar Range in Munnar division towards the east and then along the southern boundary of Eravikulam National Park till the boundary of Kadalar Tea Estate. The southern boundary of Mankulam runs along the northern boundary of Latchmi Tea Estate and Kainagiri Estate. The western boundary runs along the eastern boundary of Adimaly range in Munnar division and the eastern boundary adjoins the southern boundary of the Kadalar, Cholamala, Nallathanni, Kallar, and Latchmi Tea Estates.

AVIFAUNA

The first ever bird survey to prepare a checklist of the birds of the region was conducted in December, 2009. A total of 134 bird species were recorded in this survey. Thirteen out of the 26 bird species endemic to Western Ghats were recorded, of which eight are Red Data book species (Nameer and Praveen 2010).

Palni Laughingthrush *Strophocincla fairbanki*, a threatened species was found to be reasonably common around the sholas. This species is endemic to the high altitude hills south of the Palghat Gap. The edges of Mankulam forest division with Munnar RF and Eravikulam NP form one of the best habitats for this species. Other high altitude birds like White-bellied Blue Robin *Myiomela albiventris*, Black-and-Orange Flycatcher *Ficedula nigrorufa*, and Nilgiri Flycatcher *Eumyias albicaudatus* were also found in reasonable good numbers in the sholas.

OTHER KEY FAUNA

Mankulam is an important area for Asiatic Elephant *Elephas maximus*. Herds of elephants are known to assemble at Anakulam near Mankulam at night, which attracts tourists from the nearby town of Munnar. Other fauna include Gaur *Bos gaurus*, Sambar Rusa *unicolor*, Indian Crested Porcupine *Hystrix indica*, Malabar Giant Squirrel *Ratufa indica*, and Nilgiri Langur *Presbytis johni*.

LAND USE

- Forestry
- Plantations
- Human settlements

THREAT AND CONSERVATION ISSUES

- Illegal settlers
- Commercial plantations
- Pesticide pollution
- Forest fires

Mankulam has long been occupied by both legal and illegal settlers. Even though the Kerala Forest Department was able to evict some of the encroachments, the threat of illegal occupancy still exists. People attempt to exploit the forest for timber and firewood. Large tracts have been planted with wattle, the spreading of which is threatening the shola grasslands and the biota they support (Prasad 2011). Pollution by excessive pesticide use (mainly from Cardamom plantations) is a significant threat to rivers and the life forms they support.

Another important impact arises from accidental fires. Most of the annual fires, which are caused by humans inflict damage on the grassland habitat. However, strict fire protection measures have reduced their occurrence in the recent past.

KEY CONTRIBUTOR

E.S. Praveen

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MATHIKETTAN SHOLA NATIONAL PARK

IBA Site	:	IN-KL-31	**Altitude**	:	1,200–1,984 msl
Administrative Region (State)	:	Kerala	**Rainfall**	:	2,000–2,700 mm
District	:	Idukki	**Temperature**	:	10 °C to 30 °C
Coordinates	:	76° 14′ to 76° 16′ E, 9° 57′ to 10° 01′ N	**Biogeographic Zone**	:	Western Ghats
Ownership	:	State	**Habitats**	:	West Coast Tropical Evergreen Forest, West Coast Semi-evergreen Forest, Southern Indian Moist Deciduous Forest, Grassland
Area	:	1,281.7 ha			

IBA CRITERIA: A1 (Threatened species), A2 (Endemic Bird Area 123: Western Ghats), A3 (Biome 10: Indian Peninsula Tropical Moist Forest)

PROTECTION STATUS: National Park, established 2003.

GENERAL DESCRIPTION

Mathikettan Shola National Park is located in the High Ranges of southern Western Ghats of Kerala. Mathikettan Forest is part of Cardamom Hill Reserve (CHR). In 2002, 1,281.7 ha of the CHR land was brought under the administrative control of the Forest Department, and in 2003 it was declared as a national park (Wildlife Warden 2012).

The vegetation is mainly evergreen forests, planted with cardamom. Accordingly, the undergrowth is greatly modified, and only large shade trees remain in most of the park. The upper reaches of the national park, however, have some high altitude grasslands. Three streams which are the tributaries of Panniyar, namely Uchinikuthipuzha, Mathikettanpuzha, and Njandar, originate from these hills.

AVIFAUNA

Santhanpara, though lying outside Mathikettan Shola National Park, is contiguous to the park. Santhanpara was one of the locations visited by Sálim Ali during the Travancore-Cochin Ornithological Survey in the early 1930s. Subsequently, Sashikumar *et al.* (2011) revisited Santhanpara in 2009. While Ali & Whistler (1935–1937) recorded 93 species, Sashikumar *et al.* (2011) recorded 95 species. Though the total number of species were more or less the same, the bird community structure over the past 75 years or so has changed completely, with several habitat specialists giving way to habitat generalists (Sasikumar *et al.* 2011).

An area of 334 sq. miles (86505.6 ha) was declared as the Cardamom Hill Reserve (CHR) and notified as a Reserve

ENDANGERED	
White-bellied Blue Robin	*Myiomela albiventris*
VULNERABLE	
Nilgiri Wood-pigeon	*Columba elphinstonii*
NEAR THREATENED	
Kerala Laughingthrush	*Strophocincla fairbanki*
Grey-headed Bulbul	*Microtarsus priocephalus*
Black-and-Orange Flycatcher	*Ficedula nigrorufa*
Nilgiri Flycatcher	*Eumyias albicaudatus*

ENDEMIC BIRD AREA 123: WESTERN GHATS	
Nilgiri Wood-pigeon	*Columba elphinstonii*
Malabar Parakeet	*Psittacula columboides*
Grey-headed Bulbul	*Microtarsus priocephalus*
White-bellied Blue Robin	*Myiomela albiventris*
Kerala Laughingthrush	*Strophocincla fairbanki*
Black-and-Orange Flycatcher	*Ficedula nigrorufa*
Nilgiri Flycatcher	*Eumyias albicaudatus*
Small Sunbird	*Leptocoma minima*

Forest in 1897 by the Travancore Gazette dated 24.8.1897. The Maharaja of Travancore encouraged the cultivation of cardamom, which grew naturally in this area. The forests of CHR are situated in the catchment area of the Periyar river.

BIOME 10 INDIAN PENINSULA TROPICAL MOIST FOREST	
Indian Swiftlet	*Aerodramus unicolor*
Malabar Trogon	*Harpactes fasciatus*
White-cheeked Barbet	*Megalaima viridis*
Malabar Barbet	*Megalaima malabarica*
Yellow-browed Bulbul	*Acritillas indica*
Malabar Whistling-thrush	*Myophonus horsfieldii*
Indian Scimitar-babbler	*Pomatorhinus horsfieldii*

These forests connect Palni Hills with Periyar Tiger Reserve. The steady decline in the forest cover in CHR is a direct consequence of the large scale encroachment of forest land, deforestation for cardamom cultivation, and assignment of land under the Cardamom Rules (Travancore) 1935.

According to the Cardamom Rules (Travancore) 1935, the forests of CHR were assigned on grant/lease for the cultivation of cardamom. The State Government subsequently enacted "Rules for Lease of the Government Land for Cardamom Cultivation, 1961" and authorized the Revenue Divisional Officer (RDO), Devikulam to conduct all business related to the cardamom leases in the assignable area of the CHR. The RDO was made responsible for the detection and disposal of encroachment cases, including the right to regularize encroachment on forest lands in the

DHRITIMAN MUKHERJEE

Gaur *Bos gaurus*, also known as Indian Bison, has benefitted from protection and its population has increased in many areas, such as Mathikettan Shola National Park

CHR. The problems of CHR have been aggravated because the State continues to implement the Rules for Lease of the Government Land for Cardamom Cultivation, 1961, which are inconsistent and contrary to the provisions of the Forest (Conservation) Act, 1980.

In December, 2012, a bird survey was conducted at Mathikettan Shola National Park, jointly organized by Kerala Birder, Centre for Wildlife Studies, KAU, the Indian Bird Conservation Network-Kerala, and the Kerala State Forest Department, as part of a bird survey of various protected areas of Munnar Hills. One of the base camps was at Aduvilathan in Mathikettan Shola NP, where 51 species of birds were recorded (Praveen & Nameer 2013).. Southern Hill Myna *Gracula indica*, Square-tailed Bulbul *Hypsipetes ganeesa*, Indian Swiftlet *Aerodramus unicolor*, Oriental White-eye *Zosterops palpebrosa*, White-cheeked Barbet *Megalaima viridis*, Greenish Warbler *Phylloscopus trochiloides viridanus*, Large-billed Leaf-warbler *Phylloscopus magnirostris*, Yellow-browed Bulbul *Acritillas indica*, Kerala Laughingthrush *Strophocincla fairbanki*, Nilgiri Flowerpecker *Dicaeum concolor*, and Nilgiri Imperial-pigeon *Ducula cuprea* were the most common birds sighted at Mathikettan Shola NP (Praveen & Nameer 2013).

OTHER KEY FAUNA

No studies have been done on any other taxa at Mathikettan Shola NP, except perhaps freshwater fishes, those too in adjacent areas. The studies on piscian fauna show that this landscape is extremely important for freshwater fish conservation. For example, Panniyar stream is the type locality of the Endangered fish, *Homaloptera santhamparaiensis* (Arunachalam *et al*. 2002). It supports a population of *Horalabiosa arunachalami*, which is a Critically Endangered, Alliance for Zero Extinction (AZE) Species (Johnson & Soranam 2001).

It is also home to two other Threatened fish species, namely *Indoreonectes keralensis*, which is Vulnerable and endemic to the Cardamom Hills in both Kerala and Tamil Nadu (Rita *et al*. 1978) and *Travancoria jonesi*, an Endangered species endemic to Kerala (Raghavan & Ali 2013).

Mammals that are likely to be seen at Mathikettan are Indian Giant Squirrel *Ratufa indica*, Nilgiri Langur *Semnopithecus johnii*, Leopard *Panthera pardus*, Sambar *Rusa unicolor*, Gaur *Bos gaurus*, and Asiatic Elephant *Elephas maximus*.

LAND USE

- Forestry
- Tourism

THREATS AND CONSERVATION ISSUES

The Cardamom plantations within the national park are the greatest threat to it. The boundaries of the national park have not been demarcated. Hence, detection of encroachments is difficult and chances of marginal encroachment exist. Considerable biotic pressure is exerted by the human settlements which are located adjacent to the park.

KEY CONTRIBUTOR

P.O. Nameer

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MUTHIKULAM-SIRUVANI RESERVE FOREST

IN-KL-32

IBA Site Code	:	IN-KL-32	**Rainfall**	:	3,500 mm
Administrative Region (State)	:	Kerala	**Temperature**	:	8 ºC to 40 ºC
District	:	Palakkad	**Biogeographic Zone**	:	Western Ghats
Coordinates	:	10° 56' to 11° 04' N, 76° 37' to 76° 41' E	**Habitats**	:	Southern Tropical Wet Evergreen Forest, Tropical Semi-evergreen and Subtropical Hill Forest, Moist Deciduous Forest Subtropical Montane Grassland, Reservoir
Ownership	:	State			
Area	:	24,700 ha			
Altitude	:	*c.* 300–2,060 msl			

IBA CRITERIA: A1 (Threatened species), A2 (Endemic Bird Area 123: Western Ghats), A3 (Biome 10: Indian Peninsula Tropical Moist Forest)

PROTECTION STATUS: Reserve Forest.

GENERAL DESCRIPTION

Forming the southernmost tip of the Nilgiri Biosphere, Muthikulam and Siruvani hills are part of a wider hill range known as Palghat (Palakkad) hills. The northern tip of the Palghat Gap rises abruptly from near the Walayar-Madukkara area, as a narrow steep ridge which runs west and curves north along a series of ridges known as the Palamala-Elival-Muthikulam hills, and then continues north along the Attappady plateau up to the base of the Nilgiris. These hills in general are called the Palghat hills.

The Palghat hills include a series of high, steep, almost east-west ridges called the Palamala-Elival hills, which are clad with fairly undisturbed high elevation Tropical Moist forests. The Palamala-Elival hills continue to a high plateau called the Siruvani (Muthikulam) hills, which in turn continue east and north-east along the edge of Attappady, the Varadimala-Bolampatti hills, and the outer rim of hills along the western edge of Attappady (Nair 1991). The eastern outer slopes of Palghat hills are in Tamil Nadu. The eastern ridge encloses the Bolampatti Valley which is drained by Noyil river. Tributaries of the Bharathapuzha drain the southern and western faces of Palghat hills, and the east flowing Bhavani and its tributaries drain the Siruvani and Attappady plateaus (Nair 1991).

This area forms part of Western Ghats immediately north of the Palghat Gap. The region is in Mannarkad *taluk*, Palakkad district, Kerala. Most of the forest zone come under the Agaly Range of Mannarkad Forest Division, with some part of the southern hills falling in Mannarkad and Olavakode Ranges. Agaly Range is bordered on the north by the forest ranges of Attappady, in the west by Mannarkad Forest Range, east by Coimbatore Forest Division, Tamil Nadu and south by a narrow strip of Mannarkad Forest Range separating it from the Olavakkod and Walayar Ranges of Palakkad division (Ramankutty 2001). The proposed IBA has four sections,namely Singappara forest station (63.67 sq. km) in Agali Range, Palakkayam forest station (73.89 sq. km) in Mannarkad Range, Elival section (60.68 sq. km) in Olavakkad Range, and Akamalavaram section (76.90 sq. km) in Walayar Range.

The altitude of Muthikulam forests ranges between *c.* 300–2,060 m, the latter being the height of Elival peak, which lies on the southern border with Mannarkad and Olavakode Range. The southern ridges around Muthikulam and Karimala lie above *c.* 1,300 m and form a unique high altitude habitat. The hills gradually descend to the Siruvani reservoir, which lies at *c.* 800 m. Evergreen and Semi-evergreen forests are more common at this altitude. Apart from a few peaks on the northern side, much of the area is drained by Siruvani river and has good patches of riparian forest. Further north are the Sholayur coffee plantations and surrounding habitations. After this point, the topography merges with the Attappady Plateau, which is in a rain-shadow of the Western Ghats. Towards the east, the terrain descends to the plains of Bolampatty in Coimbatore division. To the west, the hills descend to numerous rubber plantations around Kanjirapuzha and Palakkayam. Most of the runoff from these hills collects in Siruvani reservoir, the water source for Coimbatore town. However, parts of the southern ridges also serve as the catchment for Malampuzha reservoir, while the south-west slopes provide water to Kanjirapuzha dam (Ramankutty 2001). Towards the south-west margins, beyond Karimala peak, are a series of fantastic waterfalls known as Meenvallam Falls, which are rapidly emerging as a tourist destination.

The Siruvani-Muthikulam forests fall under the Indo-Malayan Biogeographic Zone and Western Ghats biotic province. Based on the classification of Indian forests by Champion & Seth (1968), the following forest types occur within the study area (Ramankutty 2001):

West Coast Tropical Evergreen Forest: Most of the forest in the study area is of this type. Its predominant tree species are *Cullenia exarillata*, *Mesua ferrea*, *Palaquium ellipticum*, and *Dysoxylum malabaricum*. The Critically Endangered evergreen tree *Vateria macrocarpa* is endemic to this region.

West Coast Tropical Semi-evergreen Forest: This type of vegetation is found in the transitional zone of evergreen and moist deciduous forests in the brim area of Siruvani Reserve, abutting private land and adjoining the border area of Tamil Nadu. Some of the tree species found here are *Dipterocarpus indicus*, *Bombax ceiba*, *Polyalthia fragrans*, *Terminalia bellirica*, *Ficus* spp., and *Stereospermum chelonoides*.

Southern Montane Wet Temperate Forest and Grasslands: This type of vegetation is met with at higher elevations above 1,700 m at Muthikulam and Karimala. Rolling grasslands and stunted evergreen vegetation in protected folds are found in this area. The stunted evergreen forests seen among these high altitude grasslands are known as shola forests.

AVIFAUNA

Muthikulam-Siruvani hills were not ornithologically surveyed during the British era like the Nilgiris or Wayanad. Though birdwatchers have made casual visits and published notes on certain species (Venkatraman & Vijayan 1997, Yoganand 1997, Venkatraman 1998, Gokula *et al.* 1999, Gokula & Venkatraman 2003) or documented trip reports (Santharam 2000), not much has been published to provide a comprehensive view of the birdlife and threatened species. Some southern parts of this IBA in Palakkad hills were covered by Praveen *et al* (1997), but the documentation includes vast portions outside the IBA. A concerted bird survey in February, 2006 (Praveen & Nameer 2007), covering six base stations, reported 158 species including 14 species endemic to the Western Ghats. All the Threatened species inhabiting the montane ecosystems which have a distribution in the Western Ghats north of Palakkad Gap have been reported to have remarkable abundance. Two Endangered, five Vulnerable, and six Near Threatened species, apart from 14 of the 26 Western Ghats endemic species and 12 of the 15 biome-restricted species of tropical moist forests (Biome 10) have been reported here. Since then, Sashikumar *et al.* (2012) surveyed several habitats in the Muthikulam-Siruvani tracts, apart from the Palamala area further south in Palakkad hills.

Muthikulam-Elival houses the only population (Extent of Occurrence <25 sq. km) of the Endangered Nilgiri Laughingthrush *Strophocincla cachinnans* outside its main range in Nilgiris (Praveen & Nameer 2012). Praveen & Nameer (2007) recorded 18 sightings of 33 individuals but this accounts for only 1.56 birds/1000 birds observed in the entire area (Praveen & Nameer 2009). Sashikumar *et al.* (2012) who covered this area during their Malabar Bird Survey recorded 20.56 birds/10 hrs from the shola-grassland ecosystem of Silent Valley NP and Muthikulam-Siruvani forests.

Another globally Endangered and elusive bird, the Nilgiri Blue Robin *Myiomela major* has been reported from

ENDANGERED	
Nilgiri Laughingthrush	*Strophocincla cachinnans*
Nilgiri Blue Robin	*Myiomela major*
VULNERABLE	
Nilgiri Wood-pigeon	*Columba elphinstonii*
Indian Broad-tailed Grass-warbler	*Schoenicola platyura*
NEAR THREATENED	
Oriental Darter	*Anhinga melanogaster*
Great Pied Hornbill	*Buceros bicornis*
Grey-headed Bulbul	*Microtarsus priocephalus*
Tytler's Leaf-warbler	*Phylloscopus tytleri*
Black-and-Orange Flycatcher	*Ficedula nigrorufa*
Nilgiri Flycatcher	*Eumyias albicaudatus*
ENDEMIC BIRD AREA 123: WESTERN GHATS	
Nilgiri Wood-pigeon	*Columba elphinstonii*
Malabar Parakeet	*Psittacula columboides*
Malabar Grey Hornbill	*Ocyceros griseus*
Nilgiri Blue Robin	*Myiomela major*
Grey-headed Bulbul	*Microtarsus priocephalus*
Wynaad Laughingthrush	*Garrulax delesserti*
Nilgiri Laughingthrush	*Strophocincla cachinnans*
Indian Rufous Babbler	*Turdoides subrufus*
Indian Broad-tailed Grass-warbler	*Schoenicola platyura*
Black-and-Orange Flycatcher	*Ficedula nigrorufa*
Nilgiri Flycatcher	*Eumyias albicaudatus*
White-bellied Blue Flycatcher	*Cyornis pallipes*
Small Sunbird	*Leptocoma minima*
White-bellied Treepie	*Dendrocitta leucogastra*
BIOME 10 INDIAN PENINSULA TROPICAL MOIST FOREST	
Sri Lanka Frogmouth	*Batrachostomus moniliger*
Jerdon's Nightjar	*Caprimulgus atripennis*
Indian Swiftlet	*Aerodramus unicolor*
Malabar Trogon	*Harpactes fasciatus*
White-cheeked Barbet	*Megalaima viridis*
Malabar Barbet	*Megalaima malabarica*
Hill Swallow	*Hirundo domicola*
Yellow-browed Bulbul	*Acritillas indica*
Malabar Whistling-thrush	*Myophonus horsfieldii*
Dark-fronted Babbler	*Rhopocichla atriceps*
Indian Scimitar-babbler	*Pomatorhinus horsfieldii*
Black-throated Munia	*Lonchura kelaarti*

the high altitude forests above Muthikulam Falls, with three sightings mentioned by Nameer & Praveen (2007). Sashikumar *et al.* (2012) during their Malabar Survey had several sightings of *Myiomela major*, including birds singing, and this area is suspected to harbour an excellent population of this endemic species. Earlier lumped with White-bellied Blue Robin *M. albiventris*, recent genetic studies have shown *Myiomela major* to be a distinct species (Robin *et al.* 2010).

Among the Vulnerable species, Nilgiri Wood-pigeon *Columba elphinstonii* is a widespread endemic in these forests with 1.56 birds/1000 birds (Praveen & Nameer 2009), while Indian Broad-tailed Grass-warbler *Schoenicola platyurus* has been recorded near Pattiyar (Praveen & Nameer 2007). Nilgiri Pipit *Anthus nilghiriensis* has also been reported by P. Balakrishnan from the grassy slopes adjoining Siruvani dam. He also reported Wood Snipe *Gallinago nemoricola* and Kashmir Flycatcher *Ficedula subrubra* from Siruvani area, but these were only provisionally included by Sashikumar *et al.* (2011).

Among the Near Threatened species, Grey-headed Bulbul *Pycnonotus priocephalus* and Nilgiri Flycatcher *Eumyias albicaudatus* are relatively widespread, with good populations in Muthikulam hills. More than 80% of the sightings of Grey-headed Bulbul during the Malabar Bird Survey were from this site and the density was much higher than anywhere else in the forests of Kerala, indicating that Muthikulam-Siruvani is a very important habitat for this species (Sashikumar *et al.* 2012). Oriental Darter *Anhinga melanogaster* might be breeding sporadically in Siruvani reservoir Great Pied Hornbill *Buceros bicornis* are regularly reported by forest staff, though Praveen & Nameer (2007) reported only one instance of hearing their calls, and Sashikumar *et al.* (2012) saw it once. Tytler's Leaf-warbler *Phylloscopus tytleri* winters in the windward facing sholas of the Elival hills, while Black-and-Orange Flycatcher *Ficedula nigrorufa* occurs along the same range and habitat as Nilgiri Blue Robin.

A fish-eagle, most likely Lesser Fish-eagle *Ichthyophaga humilis*, occurs along the edges of Siruvani dam (Praveen & Nameer 2007), while Malabar Pied Hornbill *Anthracoceros coronatus* might also occur here as there exists a good population on the eastern slopes of Siruvani forests (Balasubramanian *et al.* 2004). The Vulnerable and peninsular endemic Yellow-throated Bulbul *Pycnonotus xantholaemus* has been observed on the eastern slopes of these hills by P. Balakrishnan (Sashikumar *et al.* 2011) and reported from the adjoining hills in Coimbatore district (Narayanan *et al.* 2006). Endemic races of species like Oriental Bay-Owl *Phodilus badius assimilis* (Praveen & Nameer 2007) and Mountain Hawk-eagle *Nisaetus nipalensis* (Sashikumar *et al.* 2011), now a distinct species (Rasmussen & Anderton 2012), has also been observed here and these are likely to be listed with a higher threat level in the near future by BirdLife International.

OTHER KEY FAUNA

The faunal diversity is expected to be very high and includes a number of endemic and Threatened species, however hardly any studies have been done in these forests. Notable species include Nilgiri Langur *Semnopithecus johni*, Lion-tailed Macaque *Macaca silenus*, Tiger *Panthera tigris*, Leopard *P. pardus*, Jerdon's Palm Civet *Paradoxurus jerdoni*, Wild Dog *Cuon alpinus*, Nilgiri Marten *Martes gwatkinsii*, Asiatic Elephant *Elephas maximus*, Gaur *Bos gaurus*, and Nilgiri Tahr *Nilgiritragus hylocrius*, some of which are endemic to the Western Ghats.

LAND USE

- Forestry
- Tourism
- Irrigation and power plants

THREAT AND CONSERVATION ISSUES

- Tourism

Siruvani dam is one of the upcoming tourism destinations in Palakkad district, and 6 km of the road leading to it runs through prime semi-evergreen forests, cutting through the paths of wildlife. A more controlled ecotourism initiative can create a win-win situation by utilizing this as a buffer zone for education and sight-seeing, while retaining the high altitude areas as the core zone.

Every year, a festival is celebrated at Muthikulam Falls and this can be reached only by trekking 5–6 hours through the pristine forests adjoining Siruvani dam on a pathway which stops at the falls at an altitude above *c.* 1200 m. Devotees stay for two days at the falls and then return with much noise and drum-beating. This celebration is currently uncontrolled and can take on the proportions of the Agasthyamalai pilgrimage if it continues – creating massive disturbance to the forests.

Much of the higher reaches of Muthikulam forests are hardly visited by forest officials, so there is a natural tendency for poachers from the neighboring Tamil Nadu to poach wild game. There are reports of poaching from these hills and tighter patrolling may be needed even in core areas to avoid human intrusion. Both Praveen & Nameer (2007) and Sashikumar *et al.* (2012) propose that this area be declared as a wildlife sanctuary to protect the unique assemblage of montane avifauna as well as other endemic and threatened biodiversity.

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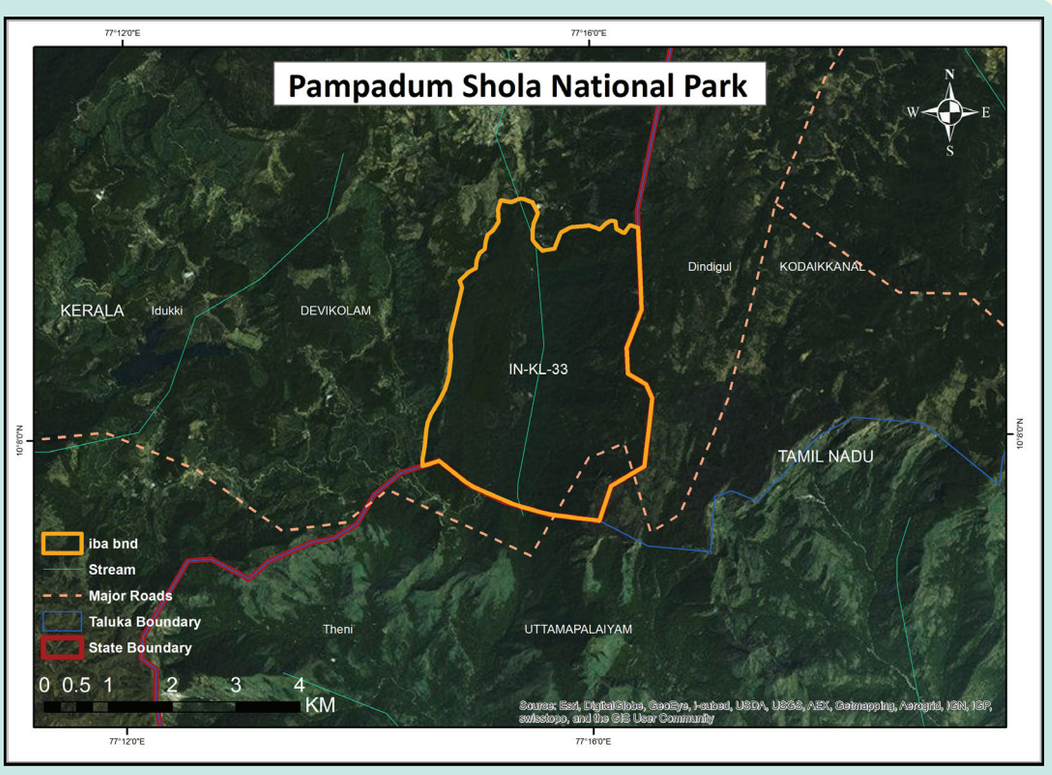
PAMPADUM SHOLA NATIONAL PARK

IN-KL-33

IBA Site Code	:	IN-KL-33	**Altitude**	:	1,600–2,400 msl
Administrative Region (State)	:	Kerala	**Rainfall**	:	4,500–5,000 mm
District	:	Idukki	**Temperature**	:	9 °C to 28 °C
Coordinates	:	10° 8′ 38″ N, 77° 16′ 1″ E	**Biogeographic Zone**	:	Western Ghats
Ownership	:	State	**Habitats**	:	Southern Tropical Wet Evergreen, Tropical Semi-evergreen, and Montane Shola Forest
Area	:	132 ha			

IBA CRITERIA: A1 (Threatened species), A2 (Endemic Bird Area 123: Western Ghats), A3 (Biome 10: Indian Peninsula Tropical Moist Forest)

PROTECTION STATUS: National Park, established December 14, 2003.



GENERAL DESCRIPTION

Pampadum Shola National Park is the smallest national park, part of Munnar hills in Idukki district in Kerala, along the Tamil Nadu border. The park is bounded on the east and south sides by the Palni Hills. Kurinjimala Wildlife Sanctuary is situated on the north-east side. The other sides are bordered by reserve forests, villages, and plantations. Pampadum Shola NP contains Tropical Semi-evergreen, Evergreen and small patch of Montane Shola forests. Some part of the national park is planted with Black Wattle *Acacia mearnsii*. A public road which connects Munnar town to the villages north of the park passes right through the middle of this national park in a north-south direction. Tourist facilities are built inside the park as part of ecotourism activities. The park also has few recently constructed trekking paths. A check-dam is present in the middle of the park, adjacent to the public road. Old Munnar-Kodaikanal Road (now not in use) passes through the evergreen/shola areas of the park.

Eravikulam National Park is the largest connected ecosystem of shola-grassland biotope in the Grass Hills. Palni Hills in Tamil Nadu are separated from Grass Hills by human habitation interspersed with small protected areas in the Munnar Hills, such as Anamudi Shola National Park, Pampadum Shola National Park, and Kurinjimala Wildlife Sanctuary. So these small protected areas provide habitat

continuity between the Grass Hills and Palni Hills, which is very important for the genetic diversity of short-flying high altitude shola-grassland specialist birds such as Palni Laughingthrush *Strophocincla fairbanki*, White-bellied Blue Robin *Myiomela albiventris*, and Black-and-Orange Flycatcher *Ficedula nigrorufa*.

AVIFAUNA

Though Pampadum Shola National Park is now regularly visited by naturalists and wildlife photographers after the advent of ecotourism activities, a scientific study of avifauna was not done till recently. The Travancore-Cochin Survey by Sálim Ali (Ali & Whistler 1935) and the repeat survey done in 2009 (Sashikumar *et al.* 2011) do not have any information from this forest patch.

In December, 2012, a concerted bird survey organized by Kerala Forest Department, KeralaBirder (E-Group of birdwatchers), and College of Forestry, Thrissur identified 68 species of birds, that included six species endemic to the Western Ghats (Nameer & Praveen 2013). In all, one Endangered, one Vulnerable, and four Near Threatened species have been reported here. Also, six of the 26 Western Ghats endemic species and eight of the 15 biome-restricted species belonging to Tropical Moist Forests (Biome 10) have been reported here. A Kashmir Flycatcher *Ficedula subrufa* was photographed here by Ranjith Ram Rony on 5 April, 2014.

ENDANGERED	
White-bellied Blue Robin	*Myiomela albiventris*
VULNERABLE	
Nilgiri Wood-pigeon	*Columba elphinstonii*
Nilgiri Pipit	*Anthus nilghiriensis*
Kashmir Flycatcher	*Ficedula subrufa*
NEAR THREATENED	
Kerala Laughingthrush	*Strophocincla fairbanki*
Tytler's Leaf-warbler	*Phylloscopus tytleri*
Black-and-Orange Flycatcher	*Ficedula nigrorufa*
Nilgiri Flycatcher	*Eumyias albicaudatus*
ENDEMIC BIRD AREA 123: WESTERN GHATS	
Nilgiri Wood-pigeon	*Columba elphinstonii*
White-bellied Blue Robin	*Myiomela albiventris*
Kerala Laughingthrush	*Strophocincla fairbanki*
Black-and-Orange Flycatcher	*Ficedula nigrorufa*
Nilgiri Flycatcher	*Eumyias albicaudatus*
Small Sunbird	*Leptocoma minima*
BIOME-10 INDIAN PENINSULA TROPICAL MOIST FOREST	
Indian Swiftlet	*Aerodramus unicolor*
Malabar Trogon	*Harpactes fasciatus*
White-cheeked Barbet	*Megalaima viridis*
Hill Swallow	*Hirundo domicola*
Yellow-browed Bulbul	*Acritillas indica*
Malabar Whistling-thrush	*Myophonus horsfieldii*
Indian Scimitar-babbler	*Pomatorhinus horsfieldii*
Black-throated Munia	*Lonchura kelaarti*

OTHER KEY FAUNA

Other than the sightings by visiting naturalists, no major studies have been conducted in this area for fauna other than birds. Based on sight reports, Pampadum Shola National Park is considered to be one of the key habitats of the rare and endemic Nilgiri Marten *Martes gwatkinsii*. Other key mammals reported include Leopard *Panthera pardus*, Wild Dog *Cuon alpinus*, Asiatic Elephant *Elephas maximus indicus*, Gaur *Bos gaurus*, Nilgiri Langur *Trachypithecus johnii*, Brown Palm Civet *Paradoxurus jerdonii*, Malabar Giant Squirrel *Ratufa indica*, and Indian Brown Mongoose *Herpestes fuscus*. The butterfly species Nilgiri Tiger *Parantica nilgiriensis* (Nymphalidae) which is restricted to some of the hills of south India and which has been listed as threatened species by IUCN was recorded to be abundant in the area. During a study of earthworms in the Munnar area, *Amynthas corticis*, a species originally native of SE Asia, but now accepted as a naturalized alien species in various parts of India was also collected from Pampadum Shola National Park.

LAND USE

- Forestry
- Tourism

THREAT AND CONSERVATION ISSUES

- Forestry activities
- Firewood collection
- Tourism
- Fires

Pampadum Shola was established as a National Park on 14/12/2003 (notification no. 12875/Fe / 2003/ F&WLD). A major part of the already small national park has been given over to Wattle plantations. This, along with the felling of trees and their transportation, is one of the key disturbances in Pampadum. These activities are carried out regardless of their impact on the wildlife and birds, and are more frequently done during the peak breeding season. This needs to be streamlined so that the habitat is not over-exploited. The vicinity of this national park to the major tourist town of Munnar also causes a high influx of tourists, which if not regulated and controlled can damage the ecosystem and disturb the wildlife. The developmental activities to support tourism also should be undertaken with care and due diligence.

KEY CONTRIBUTORS

Dipu Karuthedathu, IBA Team and Kerala Wildlife Department

DHRITIMAN MUKHERJEE

Pampadum Shola is one of the smallest national parks, with tropical Evergreen, Semi-evergreen, and a small patch of Montane Forest. White-bellied Blue Robin *Myiomela albiventris*, an Endangered species, has been reported from here

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